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The Association does not accept the responsibility for the opinions of contributors. Offensive personalities must be avoided.

THE DENVER CONVENTION AND AFTER.

IN previous numbers of the JOURNAL, frequent references have been made to the sixtieth annual convention of the American Pharmaceutical Association at Denver, August 16-24, 1912. The June issue contained the preliminary report of the Committee on Transportation on railroad routes and rates from Atlantic and Pacific coast cities respectively, a tentative program of the various sessions, and a list of entertainments provided by Denver druggists and citizens. Headquarters will be at the Brown Palace Hotel, the same hotel which was the abiding place of the Association at its Denver meeting seventeen years ago. Other hotels charging moderate rates are within convenient walking distance of headquarters.

Brown Palace Hotel.

In the early days of pharmaceutical associations, the annual meetings represented most of their activities, and between conventions the associations had only a paper existence, represented by the annual volume of proceedings, containing the constitution

and by-laws and roll of members. Such a sporadic existence, however, does not meet the enlarged demands of present-day pharmacy and consequently the more progressive associations have undertaken enterprises which make them active throughout the year. This is especially true in the case of the A. Ph. A., and was the principal cause which led to the establishment of THE JOURNAL. Throughout the year its various committees and officers are actively at work upon the subjects committed to their charge, so that the annual convention is now rather the settling-up period, or the occasion when the officers and committees make their final reports upon the work of the year and receive their instruction for the activities of the year to follow. It also represents the Grand Council of Pharmacy, when the representatives of all branches of pharmaceutical workers, retailers, manufac-

Four-Mile Canyon and the Ward Line.

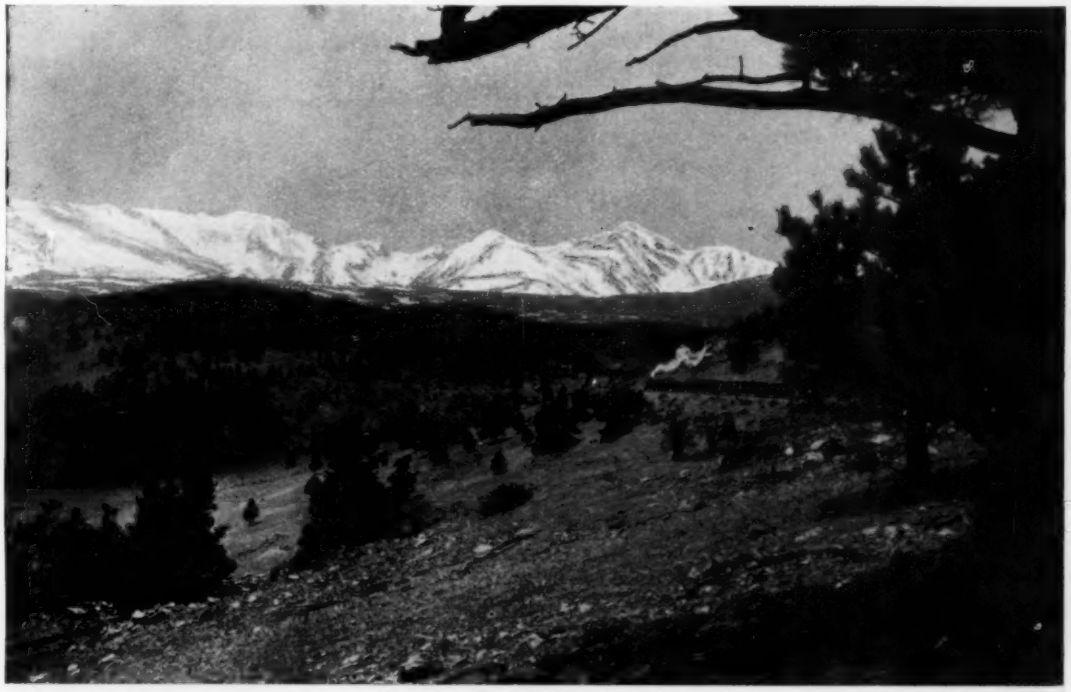
turers, boards of pharmacy, etc., come together for consultation upon their various lines of work, and also for the consideration of questions involving the relations of the different branches of pharmacy to each other.

It would be difficult to describe the nature of these meetings so that their value would be fully appreciated by those who have never attended them, while for those who are in the habit of attending, no description is needed.

The bulk of each convention is composed of those who have attended year after year for many years, no matter where the conventions are held. Certainly they believe they are profited, or they would not attend so faithfully.

To select a meeting place which shall be equally agreeable to members scattered from the Philippines to the Hawaiian Islands, and from British Columbia

to the West Indies, is of course, impossible. The Association has not only to consider the residence of the majority of its membership, but also the pharmaceutical needs of the various parts of the country. The holding of an annual convention is always marked by a revival of pharmaceutical interests in the section visited, and by the creation of enthusiasm that persists for years afterwards. These were the considerations which led to the selection of Denver for the 1912 assembly. This beautiful city is the natural gateway to the cluster of states embraced in the Rocky Mountain regions and is a center of pharmaceutical interests as well as of general culture and commerce.



The Great Snowy Range.

The program of the general sessions and section meetings has been amended in accordance with suggestions received from section officers and others and now stands as follows:

REVISED PROGRAM FOR THE SIXTIETH ANNUAL MEETING OF THE PHARMACEUTICAL ASSOCIATION.

Denver, Col., August 19-24, 1912.

(Headquarters, Brown Palace Hotel.)

Monday, August 19—

9:00 A. M. Meeting of the Council.

10:00 A. M. Meeting of the National Association of Boards of Pharmacy.

Monday, August 19—

3:00 P. M. First General Session.

(The Nominating Committee will meet immediately after the adjournment of the First General Session.)

9:00 P. M. President's Reception.

Tuesday, August 20—

9:00 A. M. Meeting of the Council.

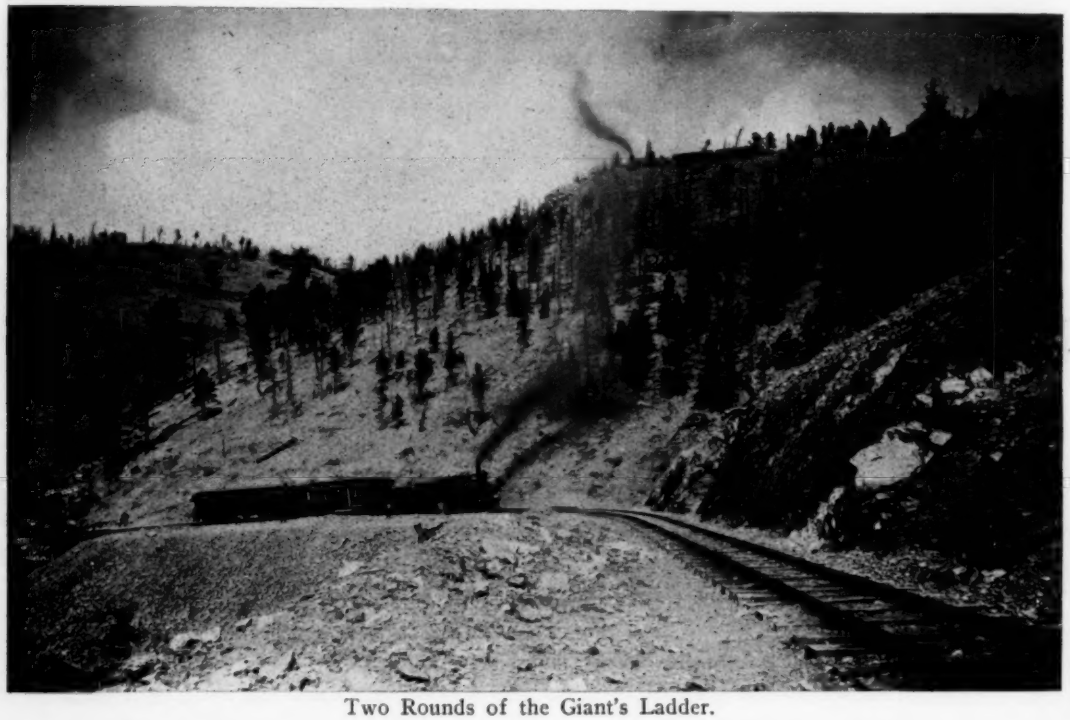
10:00 A. M. Second General Session.

3:00 P. M. Section on Commercial Interests.

3:00 P. M. Section on Scientific Papers.

8:00 P. M. Section on Commercial Interests (Second Session).

8:00 P. M. Meeting of the Conference of Pharmaceutical Faculties.



Two Rounds of the Giant's Ladder.

Wednesday, August 21—

9:00 A. M. Meeting of the Council.

10:00 A. M. Section on Education and Legislation.

3:00 P. M. Section on Practical Pharmacy and Dispensing.

6:30 P. M. Separate Reunions of College Alumni.

8:00 P. M. Section on Education and Legislation (Second Session.)

9:30 P. M. Smoker.

Thursday, August 22—

9:00 A. M. Meeting of the Council (Organization of the Council for 1912-1913).

Thursday, August 22—

10:00 A. M. Meeting of the Conference of Pharmaceutical Faculties (Second Session).
10:00 A. M. Section on Scientific Papers (Second Session).
3:00 P. M. Section on Scientific Papers (Third Session.
3:00 P. M. Section on Practical Pharmacy and Dispensing (Second Session).
8:00 P. M. Joint Session of Boards of Pharmacy and Section on Education and Legislation.
8:00 P. M. Section on Historical Pharmacy.

The Parting of the Ways.

Friday, August 23—

8:00 A. M. Mountain Excursion to Glacier Lake, visiting en route the University of Colorado and Boulder. Chautauqua Entertainment by the Citizens of Boulder. Returning to Denver at 6:00 p. m.
8:00 P. M. Section on Historical Pharmacy (Second Session).

Saturday, August 24—

9:00 A. M. Meeting of the Council.
10:00 A. M. Final General Session.

In the arrangement of the above program, it is believed that sufficient provision has been made for the successful discharge of the work which the convention will have to do. The hospitable spirit of the Denver drug trade is such that it has had to be restrained rather than encouraged in providing entertainments for the hours not occupied by business. A sufficient number of diversions have been

authorized, however, to fully occupy the time of the members between sessions. The special entertainments provided for the ladies are as follows:

PROGRAM OF SPECIAL ENTERTAINMENTS FOR LADIES ATTENDING THE SIXTIETH ANNUAL CONVENTION.

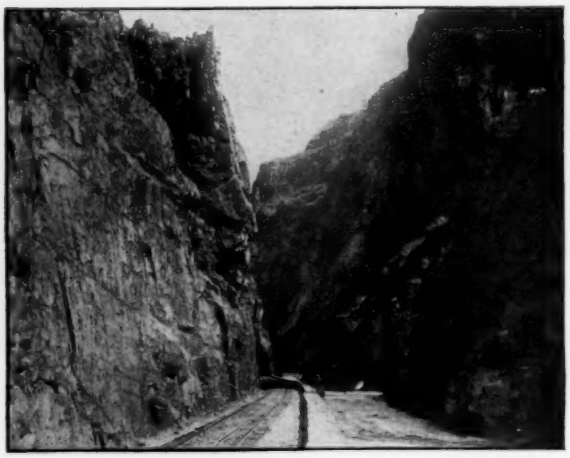
Tuesday, August 20—
9:00 A. M. Fifty-mile trolley ride, visiting the foothills about Denver.
8:00 P. M. Concert and moving pictures by E. C. Fine, of Boulder.

Wednesday, August 21—
9:00 A. M. Seeing Denver in Automobiles.
2:00 P. M. Matinee at Elitch's Gardens.
Battle of the Monitor and Merrimac.
Zoological Gardens.
8:00 P. M. Toast Banquet tendered by the ladies of the Denver State Pharmaceutical Association.

Thursday, August 22—
9:00 A.M. Autos.
3:00 P. M. Card Party at Brown Palace.

THE GLACIER LAKE TRIP.

This has been set for Friday of the convention week, and is one of the entertainments provided by the Denver druggists for the entire membership. The excursion will be over the Denver Boulder and Western Railroad, along the famous "Switzerland trail of America." In three hours' time the train traverses a distance of fifty miles through the region where sky and mountain meet, passing around the craters of extinct volcanoes to the "Crest of the Continent," yielding a continuous panorama of mountain peaks and snow-clad ranges that is probably not surpassed in any other region of Colorado. The cuts representing the Four-mile Canyon and the Ward Line, the Great Snowy Range, two Rounds of the Giant's Ladder, Parting of the Ways, and Glacier Lake are of views on this trip. At the city of Boulder a stop will be made to visit the beautiful University of Colorado, the state's principal educational institution, and to enjoy a Chautauqua entertainment tendered by the citizens of Boulder.

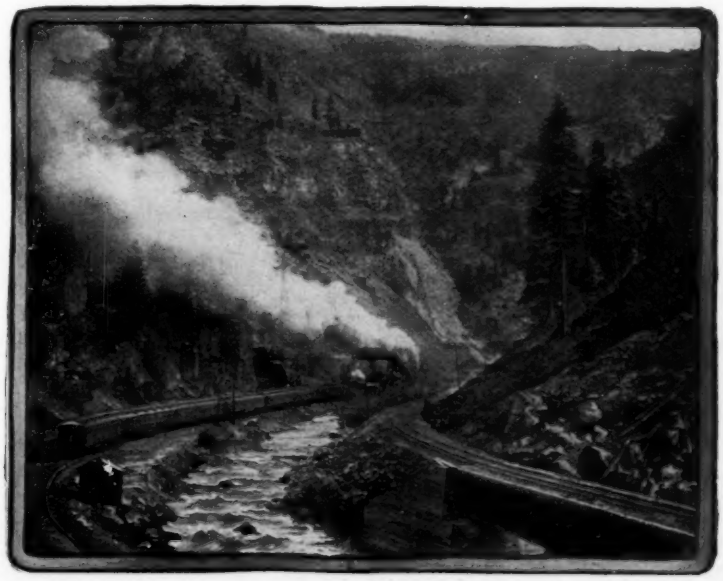


The Royal Gorge of the Arkansas.

POST-CONVENTION EXCURSIONS.

It has been customary when holding conventions in cities adjacent to regions possessing great natural attractions, to arrange for post-convention excursions, and several of these have been projected to follow the present meeting. The advantages of such excursions are that they enable the members to visit portions of the country which otherwise they might never be able to see and at less cost than under ordinary circumstances. Regular attendants of past conventions recall the excursions down the St. Lawrence to Old Quebec, to the Yellowstone National Park, the Grand Canyon of Arizona, the Yosemite National Park, the Big Trees of California, Catalina Islands in the Pacific Ocean, the Columbia River, the Glaciers of the Canadian Rockies, etc., as among the most glorious recollections of their lives.

Following the Denver meeting several trips of this kind will be possible. One of these is the celebrated "Circle Trip" over the picturesque Denver and Rio



Eagle River Canyon.

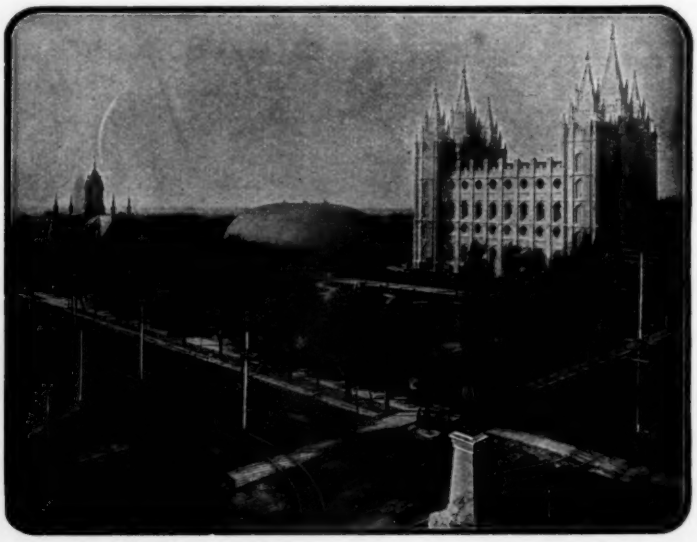
Grande Railroad, through the most attractive portions of the Rocky Mountains, and covering four days, traveling by daylight only. The cost will be $28.00 for the round trip, or in parties of ten, $20.80.

The trip to Salt Lake City will include a portion of the circle trip, and passes through the cities of Colorado Springs and Pueblo, then through the Royal Gorge and Grand Canyon of the Arkansas River, one of the most remarkable chasms in the world through which a railroad passes, where the granite walls of the canyon tower 2627 feet on either side of the track. The road then passes through Salida, the Brown Canyon, passing Collegiate Peaks, then over Tennessee Pass of the Continental Divide and through the Eagle River Canyon, thence through the

canyon of the Grand River, and by way of Glenwood Springs to Salt Lake. At Salt Lake City opportunity will be given for seeing the great Tabernacle and the wonderful lake of saturated brine which has given its name both to the city and to the remarkable valley in which it is located. Passengers who desire to remain for a longer period of time at Salt Lake City will have the privilege of doing so.

Returning, the excursionists will have the privilege of coming by way of the same route as going, with a six hours' stop at Glenwood Springs, where they can view the famous swimming pool fed at one end by nearly boiling water from the bowels of the earth, and at the other end by ice-cold water from the mountains, or, if they prefer, they can return from Salt Lake City to Denver by way of Montrose and Gunnison through the Black Canyon, and over the Continental Divide by the way of Marshall Pass, where the track reaches the altitude of 10,854 feet.

For those who have the time to spare and the additional "medium of exchange,"



Temple Square, Salt Lake City, Showing Temple, Tabernacle, and Assembly Hall.

there will be offered the opportunity of a trip to and through the Yellowstone National Park, the expense of which includes also that of the Salt Lake trip; and there is also the possibility of making trips to the Pacific Coast at reasonable rates.

It would be useless of course to attempt even to enumerate all of the possible places to visit, or the opportunities for enjoyment afforded by the vast Rocky Mountain region adjacent to Denver, and therefore, we have attempted to mention only a few of those most conveniently and cheaply reached, which are possible to the average member who will attend the convention.

J. H. BEAL.

WHAT BOARDS OF PHARMACY CAN DO TO RAISE THE REQUIREMENTS FOR REGISTRATION.

IT is quite probable, judging from their activities, that but few boards of pharmacy have realized the full extent of the powers conferred by the law which they are appointed to enforce.

One very well settled principle of statutory construction is that when an official body is expressly empowered to discharge a specific function the grant of express powers carries with it such implied powers as are necessary to carry the expressed powers into effect. If it were not so, boards and commissions would frequently be incapable of discharging the functions imposed upon them, since the infirmities of human foresight, and the limitations of languages are such that it is practically impossible to provide in advance for all the possible contingencies of administration, or to meet the devices of those who would evade the spirit of the law while apparently complying with its literal verbiage.

While the general rule is as above stated there are limits, of course, to the extent to which implied powers can be read into a grant of express powers.

For example, it is well settled that a board cannot change the meaning of the law, or extend the scope of its provisions beyond the limits set by the legislature, or in other words that it cannot adopt rules and regulations which would operate to diminish the rights or increase the responsibilities of those affected by the law, or which would make criminal any act not criminal under the law itself, because such functions belong exclusively to the regularly constituted law-making body, and cannot be delegated to others.

In determining the nature and extent of implied powers we also must not lose sight of the fact that statute law is largely a matter of definition, and hence that the manner in which an official act is discharged, or its legal form, may have as much to do in determining its validity as the character of the act itself, i. e., that an executive act may be valid in one form and invalid in another, though in substance and effect both may be practically the same.

It probably will not be seriously disputed that the purpose of the board examination is to test the candidate's fitness to practice pharmacy with safety to the public. The manner in which the test is to be made is always left largely, and in many cases, wholly to the discretion of the board. The fact to be determined is made clear in the law, but the manner of its determination, and the final decision as to the abilities of the candidate are matters entirely within the board's official discretion.

I hold, therefore, that the board of pharmacy may properly include in an examination anything and everything it deems necessary to test the candidate's fitness for registration, provided the inclusion is made in proper manner and form.

As an example of a possibly improper method of exercising official discretion, suppose the board should adopt a formal rule that only high school graduates or graduates from a college of pharmacy would be registered. The court might overthrow the rule upon the ground that it imposed an obligation not imposed by the law. The court would likely say that it was the business of the board to test the present fitness of the candidate, not the manner in which it was obtained.

On the other hand, suppose the board avoids all such formally expressed rules, and instead should set an examination based entirely upon the Pharmacopœia, but one that would require the ability and training which an average high school graduate might be supposed to possess in order to pass. In this case I am inclined to think the court would very likely sustain the board's action; for the Pharmacopœia is a part of the law, and the pharmacist must comply with it, an obvious impossibility unless he can interpret its language and solve the problems based upon the official processes. It would be unreasonable to suppose that the court would not uphold the board in requiring the candidate to show that he can do the very things which the law says he must be able to do.

If the logic of the above illustration is sound, then without further legislation the boards have the power to enforce all proper educational requirements.

In the writer's opinion the difficulty of the board would be not so much in satisfying the courts as to the reasonableness of their action, as in satisfying the druggists who want cheap clerks, and who in their anxiety to get them lose sight sight of the fact that cheap clerks sooner or later develop into cheap competitors.

As a matter of fact, it is this short-sightedness that has been largely responsible for the multiplication of drug stores beyond the needs of the population, at the same time decreasing the visible supply of clerks, and also the ability of their employers to pay them reasonable salaries.

To illustrate, suppose that in a given district there is business enough to just comfortably support one store conducted by the proprietor and one clerk, and suppose the clerk leaves his employer and sets up a competing store. There is now a demand for two clerks instead of one, while the volume of business from which each is to be paid has been halved.

As a consequence both employers seek to obtain still cheaper help, and thus the vicious circle is perpetuated; for it is natural for the employe who is overworked and underpaid to imagine that his position would be better if he had a store of his own, so there is a constant tendency to multiply stores to the point where they will barely pay running expenses. Of course the stores which do not pay running expenses are eventually eliminated by the joint action of the sheriff and insolvency court, but leaving the local trade demoralized, and a tendency for the situation to repeat itself after the former disaster has been forgotten.

The program for the correcting of this excessive competition—if it is capable of correction—has not yet been worked out, but certainly one of the first steps is in the cultivation of the broad-mindedness that will on the one hand prompt the employer to pay the faithful employe as nearly the value of his services as his business will permit, and on the other hand will lead the clerk to prefer a reasonable salary to the doubtful privilege of owning a store that barely pays running expenses, or one that is drifting toward certain bankruptcy.

The part of the board of pharmacy in this program is to use to the limit their authority to require thorough and complete educational preparation on the part of those who are to become the managers and proprietors of drug stores.

J. H. BEAL.

THE MEETING OF THE AMERICAN MEDICAL ASSOCIATION.

THE sixty-third annual session of the American Medical Association, held in Atlantic City, N. J., June 4-7, 1912, is now a matter of history and cannot help but have a lasting influence on the progress of pharmacy in the United States. The meeting was attended by upwards of 3000 physicians from all sections of the country, who, divided in fourteen sections, listened to the reading of more than 400 papers.

As in former years, the Section on Pharmacology and Therapeutics presented a program that was of unusual interest to pharmacists and not a few members of the American Pharmaceutical Association from Philadelphia, New York and other cities attended the sessions of this section and took part in the discussion. Professor Joseph P. Remington at the opening session of the Section presented an address as Chairman of the delegation from the American Pharmaceutical Association and the members of the American Pharmaceutical Association present were, on motion, accorded the privileges of the floor.

Among matters of direct interest to pharmacy discussed in this Section, the first on the program was embodied in the symposium on patents and trade-marks. The discussion on this subject was participated in by retail druggists, physicians, manufacturers and others interested in the granting or non-granting of patents and trade-mark registration on commercial substances used as medicines. As a direct outcome of the discussion a Committee was appointed to request that the Board of Trustees of the American Medical Association sue for the annullment of the trade-mark registration of an article used as medicine. On motion the House of Delegates was requested to instruct the Council on Health and Public Instruction to secure legislation abolishing product patents on chemical substances used as medicines.

The desirability of a more restricted materia medica was discussed from the standpoint of the chemist by W. A. Puckner, Chicago, that of the pharmacist by Henry P. Hynson, Baltimore, medical instruction, by E. Lefevre, New York, the medical practitioner by Oliver T. Osborne, New Haven. Further discussion was participated in by a number of the members present, the general trend of the discussion being in harmony with the action of the Committee on Useful Remedies of the American Medical Association in presenting for discussion and use a list of important medicaments to which examination in materia medica subjects by state medical examining and licensing boards might be restricted, and which list might be used as the basis for instruction in materia medica subjects by teachers in medical schools.

In a joint meeting with the Section on Preventive Medicine and Public Health, the use of intestinal antiseptics and the standarization of disinfectants was discussed at length and it was shown that many of the commercially available disinfectants were inefficient and that standarization of this class of articles must be insisted on.

Dr. Robert A. Hatcher, New York, and Dr. Carey Eggleston, New York, presented comprehensive papers on the action of digitalis and digitalis-like bodies, and these communications will no doubt go far toward establishing more definite knowledge of these important drugs.

A symposium on drug standards and drug standarization was participated in by Professor Joseph P. Remington, who presented a report of progress of the U. S. P. revision; L. F. Kebler, who discussed the quality of drugs on the market; R. H. True, who reviewed the experiments made in drug cultivation by the Bureau of Plant Industry of the United States Department of Agriculture; Horatio C. Wood, Jr., who discussed the ideals and limitations of bio-assay; Henry Kraemer, who reviewed the history and the possibilities of the retail pharmacist as a purveyor of pure drugs, and Julius H. Comroe, who discussed prescribing versus dispensing on the part of medical practitioners.

The concluding symposium, of the section program, on anesthesia was one of vital importance, not alone to physicians and pharmacists, but also to patients generally who must assume the risks attending a general or partial narcosis. In the course of this symposium Professor Charles Baskerville, of New York, presented a comprehensive review of the work that he and his students have done on the chemistry of inhalation anesthetics, and incidentally pointed out the differences now existing in the standards for the several anesthetics included in different pharmacopœias. He asserted that these standards varied widely and that many, including those of the U. S. P., permitted the presence of dangerous contaminations that should not be allowed. Statistics relating to mortality from anesthetics were discussed by several physicians and the use of spinal anesthesia or analgesia was commented on at length. Although the papers presented in this symposium will well be worth careful perusal on the part of pharmacists who are interested in supplying the best that the market affords in the way of anesthetics and of preventing contamination or adulteration of the articles supplied by them.

It is manifestly impractical to review at length the proceedings of the several sections. Pharmacists who are interested will find much of value in the several communications and in the discussions on them which will be printed in the Journal of the American Medical Association. One feature of the meeting that might be commented on in passing is the revised principles of medical ethics adopted by the House of Delegates. Section 1 is particularly interesting in that it defines the object of a profession as follows:

"Section 1. A profession has for its prime object the service it can render to humanity; reward or financial gain should be a subordinate consideration. The practice of medicine is a profession. In choosing this profession an individual assumes an obligation to conduct himself in accord with its ideals."

Section 4 of chapter 3 relates specifically to the practice of pharmacy and reads as follows:

"Sec. 4. By legitimate patronage, physicians should recognize and promote the profession of pharmacy; but any pharmacist, unless he be qualified as a physician, who assumes to prescribe for the sick, should be denied such countenance and support. Moreover, whenever a druggist or pharmacist dispenses deteriorated or adulterated drugs, or substitutes one remedy for another designated in a prescription, he thereby forfeits all claims to the favorable consideration of the public and physicians."

Another feature of the meeting that was of more or less direct interest to pharmacists was the exhibition, both scientific as well as commercial, held an-

nually in connection with the meeting of the American Medical Association. This year the exhibits were unusually well arranged and readily accessible at all times of the day. The commercial exhibition was notably free from objectionable proprietary medicines and in keeping with the scientific exhibition was generally recognized as being of educational value. The exhibitions made by the Public Health and Marine-Hospital Service and by the Chemical Laboratory of the American Medical Association attracted considerable attention and contained much material of direct interest to pharmacists.

The absence of any exhibit by pharmacists was noticed by a number of the members of the American Medical Association who expressed regret that members of the American Pharmaceutical Association did not see fit to follow up the exhibits made on previous occasions, and the suggestion was variously made that the American Pharmaceutical Association itself undertake to finance an annual exhibition of official preparations in connection with the meeting of the American Medical Association.

M. I. WILBERT.

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THE MILWAUKEE CONVENTION.

FOR years the N. A. R. D., that great organization of retail druggists, has in many ways shown its friendly regard for our own association, and consequently, it is with pleasure that THE JOURNAL calls attention to the coming N. A. R. D. convention at Milwaukee, during the week of August 12. The date was originally set for August 26, but a change was made necessary on account of its conflicting with the meeting of the American Bar Association, which is to be held in the same city.

Milwaukee is famous for various things, not the least of them being the large and beautiful auditorium in which the N. A. R. D. meeting and the National Drug Show will be held. Instead of the usual extemporized booths, made from pine boards covered with muslin, the auditorium provides artistic booths, uniform in style and size, and so constructed as to display the various exhibits to the best advantage and admitting of decorative effects of various kinds.

The past year has been a great one for the N. A. R. D., and has been marked by positive accomplishments both in presenting opposition to objectionable legislative measures and in the advocacy of wise and just ones. On numerous occasions, officers and committees of that organization have been in consultation with officers and committees of our own society upon questions of importance to the whole body of pharmacy, particularly with regard to the proper revision and correction of the Richardson Bill, which seeks to amend the Food and Drug Act. It is to be hoped that future years will bring about a still closer coöperation for common purposes between these, the two greatest organizations in pharmacy, and that they may become as closely united in active and effective work as they have been in sympathy. It is also to be hoped that at the coming meetings, both bodies will formulate and settle upon definite legislative propositions and other policies upon which they can vigorously coöperate during the coming year. When a measure has received the assent of both societies, there is little doubt but that it will represent wisely and broadly the interests of pharmacy, and when the force

of both is concentrated behind it, it will stand an exceedingly good chance of being placed upon the statute books.

The N. A. R. D. wisely restricts its membership to the proprietors of retail drug stores, because the organization was formed for the express purpose of looking after the interests of these, but among its most active organizers and members have always been found many of the most highly esteemed workers of the A. Ph. A., and the number who are members of both societies is increasing each year. This is as it should be, since the possession of a large membership in common can result only in bringing about greater unity of action, and in rendering more effective for good the reformatory efforts of both.

Those who have attended past N. A. R. D. conventions will not need to be told of what is said and done there; those who have not attended such meetings should go and see for themselves, and we trust that all A. Ph. A. members who are able to do so will attend the convention at Milwaukee.

THE JOURNAL also extends a cordial invitation to N. A. R. D. members to attend the A. Ph. A. meeting at Denver, August 19-24.

J. H. BEAL.

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ADVICE TO PHARMACISTS FROM A PHARMACIST.

AT the fifth annual "joint" meeting of the New York Branch A. Ph. A. and the Medical Society of the County of New York, at the New York Academy of Medicine, a number of interesting papers were read, as reported in the Journal A. Ph. A. for June and July.

Especially two of the papers were full of meat and spice as well, namely, "What the Physician Has to Say to the Pharmacist," by Dr. Hatcher, and "What the Pharmacist Has to Say to the Physician," by Mr. Diamond. The writer, who opened the discussion, presented still another phase of this subject, namely, "What a Pharmacist Has to Say to the Pharmacists," which was as follows: *"Don't be a jack-of-all-trades, but try and be a master of professional pharmacy!"*

As chairman of the Section of Practical Pharmacy and Dispensing, the writer also used the same words in his annual address at Richmond in 1910. This is advice which pharmacists over the entire country should heed and follow and thereby help to uplift pharmacy to the rank of a profession, where it properly belongs.

OTTO RAUBENHEIMER.

Book Reviews

THE ART OF DISPENSING. A Treatise on the Methods and Processes Involved in Compounding Medical Prescriptions, with Dictionaries of Abbreviations and Terms used in British and Foreign Prescriptions, Incompatibles and New Remedies, and Numerous Memoranda for Dispensers and Prescribers. By Peter MacEwan, F. C. S., Editor of The Chemist and Druggist. Ninth Edition. Cloth; 584 p; 6S.4d. The Chemist and Druggist, 42 Cannon St., London, E. C., Eng.

The first edition of this, the standard work on prescription practice in Great Britain, appeared in 1888, and contained 288 pages; the present revised and enlarged edition contains 584 pages.

After introductory chapters dealing with the general principles of dispensing and compounding, weights and measures, special drugs and dispensing conveniences, etc., the work takes up the solid forms of medicine, as pills, pellets, lozenges, pastilles, capsules, powders, suppositories, bougies and pessaries; then deals with the more or less semi-solid preparations, as ointments, plasters, pastes and jellies. Treatment of liquid medicines is begun with a chapter on mixtures, and is followed by chapters on emulsions, lotions, injections, ampoules, embrocations, liniments, sprays and inhalations.

The main portion of the text is followed by fairly complete and well balanced chapters on incompatibilities, foreign prescriptions, and a dictionary of terms used in French, German, Dutch Italian, Norwegian, Portuguese and Spanish prescriptions.

The chapter on New and Unofficial Remedices fills 58 pages, in double column, and furnishes information and dispensing notes on over seven hundred articles.

The work as a whole not only presents a resumé of the best prescription practice in Great Britain, but is almost equally useful for American dispensers and students.

J. H. BEAL.

A TREATISE ON COMMERCIAL PHARMACY. Intended as a reference book and text book for pharmacists and their clerks. By D. Charles O'Connor; 408 pages, cloth, with numerous illustrations and plates. J. B. Lippincott Co. $2.50 net.

The stereotyped "filling a long-felt want," may be justly applied to the above volume. Avowedly written from the commercial standpoint, it emphasizes the business side of pharmacy. It is written in a catholic spirit, however, and gives much wholesome advice respecting the professional and scientific side of the pharmacist's calling.

The idea of the book is to recognize existing conditions, and to set forth such plans and methods as will best enable the druggist to successfully grapple with the trade problems which are forced upon him.

The principal divisions are: Finance, Planning and Arranging of Business, Present and Future Problems, Thorough Knowledge of Business, Business Econ-

omies, Settlements and Store Service, Buying Goods, Salesmanship, Advertising, Window Displays, Special Sales and Side lines, and Business Building; each division containing two to eight chapters.

Altogether it is a thorough-going, wholesome treatise, and while we may deplore the fact that the business problems of the modern druggist overshadow his professional functions, we must welcome a book which considers the subject in so a thorough and adequate manner.

The volume is finely illustrated, and in general attains to the typographical excellence characteristic of the Lippincott publications. J. H. BEAL.

MISROSCOPY AND THE MICROSCOPICAL EXAMINATION OF DRUGS. By Charles E. Gabel, B. S., Ph. D. Microscopical Food and Drug Analyst, Iowa State Dairy and Food Commission. 113 pages, with blank pages for notes and drawings. Cloth. The Kenyon Co., Des Moines, Ia.

Part one consists of ten chapters dealing with light, lenses, simple and compound microscopes, microscopic photography, accessories, manipulation, histology, micro-chemistry, preparation and mounting of objects, plant cells, tissues and organisms, microscopy of starches, etc., with laboratory exercises and instructions.

Part two deals with the microscopic examination of drugs. Directions are given for the study of thirty-five important and more or less typical drugs, followed by appendices containing tables for the determination of cell contents, reagents of general utility, diagrams illustrating the action of lenses on light, cuts of microscopical and projection apparatus, bacteria, tissue systems, microphotographs of powdered drugs, etc. J. H. BEAL.

E. MERCK'S ANNUAL REPORT OF RECENT ADVANCES IN PHARMACEUTICAL CHEMISTRY AND THERAPEUTICS. Volume 24; 419 pages. Paper. E. Merck & Co.

This, the 24th volume of Merck's Annual Report, is similar in general character to its predecessors of the past few years, except as to its somewhat greater size.

The introductory chapter treats of the Cacodylates and their therapeutic uses, and covers 38 pages, giving a brief history of the introduction of the arsenium compounds, and dealing more extensively with later development of these compounds and their therapeutic application.

The second chapter presents a very readable account of the history of Kephir grains and their use in kephirizing milk.

The main body of the volume is devoted to abstracts from the world's medical and pharmaceutical literature on recent advances in pharmaceutical chemistry and therapeutics, beginning with Acetone and its use in the treatment of uterine carcinoma, and ending with Zinc Perhydrol.

The book also contains a Biographical Index, an Index of Authors, General Index, and an Index of Diseases, Symptoms and Indications for Treatment.

J. H. BEAL.

Papers Presented to Local Branches

OINTMENT BASES.*

DR. EUGEN UNNA.

It gives me great pleasure to address you on a subject which I hope will be of interest to you. I intend to give, in the form of a critical comparative review, a short summary of the ointment bases which have been in general use up to the present time.

As you know, up to the middle of the nineteenth century, fats of animals and plants were used for the preparation of ointments. Among these fats, mutton-fat and lard played the most important roles. Lard has always been preferred. While, like lard, mutton-fat is a mixture of the glycerides of palmitin, stearin and oleic acid, in lard the percentage of oleic acid is much higher and for this reason its consistency is softer and it is blander.

The disadvantages of both fats are that they cannot be kept long without becoming rancid and they cannot be mixed, to any marked degree, with alcohol, water, hydrocarbons, and glycerin. Yet this miscibility is the first desideratum of a perfect ointment base. In the middle of the seventies two mineral bases were placed on the market: petrolatum and paraffin. Both products are obtained in the processes of manufacturing petroleum. At that time, with these new bases it seemed possible entirely to replace the animal fats. Only the fact that it is possible to preserve lard by benzoating it enabled that fat to hold its place among the ointment bases. I may mention here that German dermatologists did not aupreciate the benzoated lard for the following reasons: First, the stability was not complete; and secondly, the addition of benzoin resulted, particularly on tender skins, in disagreeable irritations.

When Hebra, the father of dermatology, about forty years ago, raised this science to the position of a special branch of medicine, it happened fortunately, that just at that time two new ointment bases, petrolatum and paraffin, found their way into the medical profession. These mineral fats which, owing to their stability and harmlessness, soon obtained an important position in the technic of ointments, are hydrocarbons of the alipathic series. By petrolatum or "vaseline" we understand, as you know, a solution of isoparaffins in liquid hydrocarbons of various combinations. Its melting point does not differ much from the melting point of lard, but in comparison with the latter it is extremely greasy and difficult to remove from parts to which it has been applied. These shortcomings, though, are equalized by a decided advantage; petrolatum can be kept

*Read at the June meeting of the New York Branch of the American Pharmaceutical Association.

indefinitely. This could not be said of lard, even if the latter was benzoated. This advantage of petrolatum being evident, how about its innocuous effects on the skin, as well as on admixed medicaments?

Petrolatum is generally believed to be stable and immutable. Nevertheless there exist in petrolatum, as you know, several oxidation products such as vasogen, vasoliment, and vaselinum adustum, which show that deterioration of the fat could be possible. Some time ago I investigated with my colleague, Golodetz, different kinds of petrolatum. The idea was to find why certain organic oxidation products after having been mixed with petrolatum lost their activity. We succeeded, partly by using the old sulphuric acid reaction, partly by means of osmic acid, to prove the existence of certain reducing bodies, which according to my opinion, must have a similar constitution to oleic acid. While we may consider petrolatum stable for practical use, we must keep in mind that it often contains reducing bodies, which undoubtedly are able to destroy the action of oxidizing medicaments.

Paraffin is entirely free from this drawback. Petrolatum is a residuum, paraffin a distillate, and is therefore purer. I do not need to discuss here the different kinds of paraffin, because I know that you are absolutely familiar with this subject; their main properties are generally the same. Paraffin ointment really is an ointment base which fulfills all demands for blandness and stability.

The advantage mentioned obtained for petrolatum and paraffin first place amongst the ointment bases whilst lard, and even benzoated lard, lost the greater part of its importance. But these ointment bases are not yet the ideal ones. A most important property is still lacking in them to a great extent, that is, miscibility with water and other liquids. Experiments which I have made with the just-mentioned bases have shown that none of them would combine with more than 30 per cent of water.

When in 1885 the adeps lanæ or lanolin was put on the market, this above-stated disadvantage seemed to have been overcome. To avoid misunderstanding I wish to define the terms "wool-fat" and adeps lanæ" of the Pharmacopœia. The Pharmacopœia of the United States calls adeps lanæ a purified wool-fat. This termination leads us to think that the difference between these substances is just about the same as the difference between crude zinc oxide and the purified zinc oxide. That that is not the case was shown by the thorough investigations which P. G. Unna made about the ingredients of wool-fat and of the so-called purified adeps lanæ or "lanolin." I quote from his report of these investigations the following: "At that time we were entirely in the dark as to the difference between wool-fat and the purified wool-fat, 'lanolin.' We know now, though, what we have to understand under the term 'purified wool-fat.' It is a mixture of the above-mentioned alcohols and fat acids, partly in the free state, partly combined as ethers; it contains outside of this 5 to 8 per cent of natural potassium soaps. When compared to the other fats it is characterized by the following properties; it contains isocholesterin, oxycholesterin, lanocerin acid and lanopalmin acid, whilst glycerin is entirely lacking.

"Lanolin, therefore, is only a part of the natural wool-fat; it contains all the ingredients of the latter, but their quantity is entirely different, for during the

process of cleaning wool-fat, the greatest part of all three cholesterins and a large percentage of the lanocerin wax is lost."

We will see that through the method of cleansing used for the adeps lanæ of the Pharmacopœia, we lose its most important constituent. Now it is just on account of this constituent that adeps lanæ has been accepted by the Pharmacopœia. I will prove that the acception of the wool-fat in the purified state was a mistake in the Pharmacopœia. After Hartmann, in 1860, and Schulze, in 1872, had proved that the fat of sheeps' wool contained cholesterin and isocholesterin, O. Braun discovered the peculiar property in this same fat, of taking up, in a physical way, large quantities of water. Liebreich claimed, in 1886, that the latter property was brought about by the former. Yes; he even went so far as to say that the absorbing quality was a reaction for "cholesterin fats." It is also due to the authority of Liebrich that this opinion, based upon poor experiments, soon found its way into the most important medical text books. For years it was considered as a fact without receiving the slightest opposition. This was very feasible, for Liebreich gave for his opinion an explanation which at that time seemed credible enough, but nevertheless was based upon great errors.

The next fault that Liebreich had made was, that he started with the wrong opinion; that is, that the capacity for absorbing water belonged to the cholesterin ethers.

In order to prove this, he used Liebermann's cholesterol reaction, by which free cholesterin, but not its ethers, is shown. Without taking notice of this fact, he simply claimed that this reaction could be used for cholesterin fats. He says: "Cholesterin fats, in which not a trace of free cholesterin could possibly be present, were shown with extreme sharpness by the cholesterol reaction." Taking this second error as a fact, Liebreich examined the human skin, which, as you know, contains cholesterin, on the cholesterol reaction. He showed the presence of free cholesterin, but he himself believed that he had shown his cholesterin fats, to which, according to his opinion, belonged the capacity of absorbing water. He even went so far that he claimed the human skin, showing the cholesterol reaction also must contain "lanolin" (adeps lanæ).

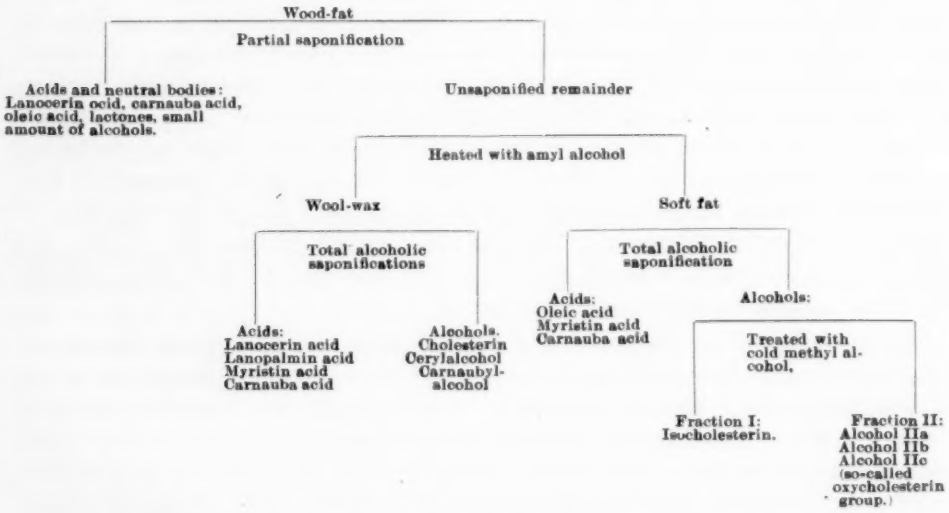
We are indebted to the Russian chemist, Lifschuetz, for having discovered, after twelve years of work, in wool-fat the body to which only belongs the power of absorbing water. Thus he enabled P. G. Unna finally to correct the errors of Liebreich, which have been accepted by the pharmacopœias of all nations, up to the present day, as facts. Lifschuetz first isolated the cholesterin ethers of Liebreich and proved that no noteworthy power of absorbing water belonged to them. Then he discovered his well known acetic-sulphuric acid reaction on the spectrum of which he clearly could determine the relative absorbing power for water.

He arrived further at the very logical conclusion: "If a reaction shows by its intensity the relative capactity for water, it must necessarily be also a reaction for the very body to which belongs this capacity of absorbing water." In this way he succeeded partly by saponification, partly by alcoholic extraction and fractional distillation, in isolating a body from the wool-fat, which he called alcohol II. *c*, and which forms a group of free alcohols of iso and oxycholesterin. To this

group then belongs the water-absorbing power of wool-fat, but it is only contained to a small percentage (about 0.5 per cent) in the crude fat.

The adeps lanæ of the Pharmacopœia contains this important body in a still smaller percentage, as by the peculiar process of purification, just this body is almost lost. P. G. Unna, to whom we are indebted for the thorough investigation of the new body of the oxycholesterin group, discovered by Lifschuetz, eucerin wax, and the new ointment base prepared from it, eucerin, the composition of which we shall consider later, has shown by his experiments that the commercial adeps lanæ has a capacity for from 30 to 200 per cent. of water, while eucerin wax combines with 700 per cent. The principal difference in the composition of the adeps lanæ of the Pharmacopœia and the eucerin, or, if I may say so, the improved adeps lanæ, is the following: In the adeps lanæ of the Pharmacopœia the good properties of the oxycholesterin group are sadly influenced by the presence of the high molecular acids and alcohols. In the new ointment base, eucerin, we find the only important constituent of adeps lanæ free from all drawbacks ready to display its action unrestricted. By the addition of 5 per cent. of this eucerin wax we are able to combine any fat with an amount of water up to 300 per cent. and even more.

Allow me to demonstrate to you in the following the composition of the crude wool-fat, of the adeps lanæ of the Pharmacopæia, and the isolation of its most important constituent, the eucerin wax:


Wood-fat
Partial saponification
Acids and neutral bodies: Lanocerin acid, carnauba acid, oleic acid, lactones, small amount of alcohols.
Unsaponified remainder
Heated with amyl alcohol
Wool-wax
Soft fat
Total alcoholic saponifications
Total alcoholic saponification
Acids: Lanocerin acid Lanopalmin acid Myristin acid Carnauba acid
Alcohols. Cholesterin Cerylalcohol Carnaubyl-alcohol
Acids: Oleic acid Myristin acid Carnauba acid
Alcohols:
Treated with cold methyl alcohol.
Fraction I: Isocholesterin.
Fraction II: Alcohol IIa Alcohol IIb Alcohol IIc (so-called oxycholesterin group.)

Let us now consider the properties of adeps lanæ. Crude wool-fat has a disagreeable odor which even adheres to the purified adeps lanæ. It cannot be kept any length of time without becoming rancid. The absorbing power for water is changing with the degree of the so-called purification, for, as I said before, the more wool-fat is purified, the smaller becomes its absorbing power for water. Extreme purification is liable to give you an adeps lanæ which will not absorb any appreciable amount of water.

Another and probably the most objectionable feature is its pitch-like tenacity.

This tenacity and also its proneness to rancidity are due to the presence of the just-mentioned acids and alcohols.

You know yourselves how difficult it is for the pharmacist to prepare ointments with adeps lanæ. In order to show you its disadvantages as a medicinal agent, I have to explain first the value of an absorbing capacity for water in therapeutics.

Cooling ointments or cold creams are of great importance to the dermatologist. The cooling effect is brought about by the water which is incorporated into the fat. As you know, this cooling effect is dependent on a physical phenomenon. Water has the property of evaporating. For this purpose it needs heat. This heat it abstracts from the surrounding surface, in this case from the human skin, which is cooled thereby. It is clear, therefore, that the larger amount of water present and the quicker its evaporation, the greater must be the cooling effect.

Adeps lanæ does not take up water readily. The suspended water it gives up slowly on account of the tenacity of the fat. In other words, the cooling effect is thereby decidedly minimized. In eucerin the result is just the reverse, owing to its great affinity for water and its lack of tenacity. Here we have the full benefit of evaporation of the water contained in the ointment, and the long-ventilated question as to a suitable basis for cold cream has found its happy solution in the discovery of this substance.

But in this combination of wax alcohols with mineral fats we will find another very important property. That is, the facility with which the ointments prepared with it can be rubbed into the skin. The reason therefore seems to be of a physical nature and due to the hydrophilia of the oxycholesterin group. When I speak about the concentrated eucerin-mercury ointment, I shall have an opportunity to give you a striking example of this property.

Now we have to ask: "What have modern therapeutics and cosmetics to demand of a perfect cold cream?"

First. It must have a great absorbing power for water; secondly, its fat basis must be unchangeable; and finally, its consistence has to be soft, but not greasy or even sticky. All these properties we find separated in the ointment bases known hitherto, but nowhere combined. Adeps lanæ has a rather great absorbing power for water, but its action is only slightly apparent. It is of great tenacity and stickiness, and its fat basis cannot be kept long. Petrolatum and paraffin, although they may be kept long, are lacking in an absorbing power for water, and therefore cannot be used for the preparation of cold creams. Lard has the advantage of great softness and blandness, but it does not have the important keeping qualities and the capacity for water.

The compilers of the Pharmacopœia in constructing the formula for cold cream had to ignore the other properties and took into consideration only the softness. They prescribed a mixture of white wax, spermaceti, and oil of almonds, and so succeeded in preparing an ointment base of great softness and blandness. But, as the ability to take up water was lacking, the percentage of oil of almonds had to be increased to such an extent that the keeping qualities

became diminished. The result was, that the cold cream of one Pharmacopœia did not contain more than 19 per cent. of water, while in the cold cream of another Pharmacopœia was combined only 25 per cent.

This has been the situation up to the present day. It was clear that the problem of the cold creams was solved at once when we became able to incorporate with any stable and harmless ointment base a body which gave to it the lacking properties of softness and absorbing power for water. This body is eucerin wax, discovered by Lifschuetz. Only 5 grams of this wax melted together with 95 grams of petrolatum or paraffin ointment form an ointment base of extraordinary softness, which can be kept indefinitely and which may be combined with water up to 500 per cent. Such a great amount of water is desirable, of course, only in special cases. There has therefore been recommended as the cold cream of the next edition of the German Pharmacopœia, a paraffin ointment which contains 5 per cent. of eucerin wax and 60 per cent. of water, that is to say, more than three times as much as unguentum aquæ rosæ.

We had the same difficulties for years and years with unguentum glycerini, and the successful solution of this problem is also due to the discovery of the new wax alcohols. In spite of the complicated formulas which came into use in the course of years, it was not possible to prepare an ointment base which could be combined with more than 40 per cent. of glycerin. However, a combination of petrolatum with 5 per cent. of the oxycholesterin alcohols will take up 400 per cent. of glycerin.

As the time which I am allowed to speak is necessarily limited, I cannot go through the development of the formula for unguentum glycerini of the Pharmacopœia. Therefore, I refer to the thorough investigations of unguentum glycerini cum eucerino by P. G. Unna and P. Unna, in which the question of the unguentum glycerini seems finally to be settled. The formula which has been recommended for the German Pharmacopœia consists of a mixture of 20 grams of anhydrous eucerin and 20 per cent. of glycerin.

I may mention here that we have to understand under eucerin wax the group of free alcohols of the iso- and oxycholesterin group. Five grams of this wax together with 95 grams of petrolatum give the anhydrous eucerin, which forms by the addition of a certain quantity of water the eucerinum cum aqua.

I am now going to speak about one of our most important ointment combinations, mercury ointment. The pharmacopœias of all nations have always shown the highest interest in this universal medicament for syphillis. At all times it was the principal idea to prepare an ointment which contained the mercury as concentrated as possible. Let us consider next the formula given by the last edition of the German Pharmacopœia. There we find a very complicated formula which seems to have been brought about with the intention of facilitating the disintegration of the metallic mercury; 40 grams of lard, 25 grams of suet, 5 grams of adeps lanæ, and 1 gram of peanut oil are mixed with so many grams of mercury that an ointment containing 30 per cent. of mercury is formed. I do not need to emphasize that besides the small percentage of mercury

we have here a combination of all the drawbacks of the ointment bases previously mentioned. The formula of the United States Pharmacopœia had already proved a progress. It contains 50 per cent. of mercury, is less complicated, and denotes an effort to increase the keeping properties of the lard by benzoating it. Nevertheless, this ointment also becomes rancid. This disadvantage ought to be strictly avoided, however, as this particular ointment, in mercury inunctions is absorbed by the human skin more readily than any other preparation.

All these disadvantages have been avoided at the Eppendorfer Krankenhaus, the governmental hospital of Hamburg, by introducing a preparation of the following composition: 135 grams of mercury and 30 grams of anhydrous eucerin were mixed with the subsequent addition of 6 grams of water. The result was an ointment containing 79 per cent. of mercury. By diluting with eucerinum cum aqua, an ointment could easily be obtained, the amount of mercury in which corresponded to the formulas of the United States or German pharmacopœias. The disintegration of the mercury in this formula is very simple and can be done with great rapidity. But, besides that, we find here another new property. While inunctions made with the mercury ointment of the Pharmacopœia took about twentyfive to thirty minutes, experiments which have been made with the eucerin ointment in German hospitals have shown that five to six minutes were sufficient to make the mercury disappear in the skin.

In conclusion, allow me to summarize once more the main properties of the mentioned ointment bases in the form of a table:

	Odor	Consistence	Stability	Capacity for Liquids
Lard	existing	very soft	becomes rancid	very small
Suet	existing	rather soft	becomes rancid	very small
Petrolatum	none	soft	can be kept	small
Paraffin ointment	none	soft	can be kept	small
Adeps lanæ	existing	greasy and sticky	becomes rancid	up to 200 per cent.
Eucerin	none	very soft	can be kept	up to 500 per cent.

It is not the object of this address to give a review of the practical uses of the ointment bases in therapeutics. I have spoken thoroughly about this matter in an address given before the Royal Society of Medicine in London. Therefore, should you be interested, I take the liberty of referring you to that address.

It seems to me by the analysis of adeps lanæ and the discovery and isolation of the very important group of wax alcohols, that we have entered a new stage of ointment technic. It is difficult to say to which of the above named ointment bases will be accorded the position of greatest efficacy. The most suitable would be lard on account of its soft consistence. This can only be possible if we should succeed in increasing its keeping properties indefinitely by adding a body which in contrast to benzoin is harmless and which is, on the other hand, of such a character that the ointment base prepared by it does not lose its harmlessness, in spite of the addition of medicaments of any kind.

As long as that is not possible we will have to prefer the stable mineral fats, whether they are called petrolatum, paraffin, or otherwise. Adeps lanæ loses its

importance utterly, since we are able to isolate its most precious constituent, free from all the drawbacks of the crude fat. Eucerin wax, finally, is not an ointment base at all, but the long-sought-for body, by means of which we are able to render any stable fat into an ideal ointment base.

THE PRODUCTION OF VACCINE.*

W. F. ELGIN, M. D.

I shall discuss the question of vaccination tonight largely from the laboratory side, leaving for the gentlemen who follow me, its practical application. But to make a connected story for the benefit of those present who may not be familiar with the subject, I shall call attention to a few historical facts in reference to smallpox, the ravages of the disease, and the earlier methods employed to secure protection.

It is thought by some that the great plague of Athens referred to in the History of the Peloponnesian War, was smallpox. It was probably unknown in China prior to the twelfth century, B. C., but is said to have prevailed in India at a much earlier date.

Rhazes, an Arabian physician who died in 932, A. D., seems to have been the first to give a succinct account of the disease.

According to some authorities, the disease was probably unknown in Europe prior to the sixth century; others claim a much more remote antiquity. Smallpox appears to have been introduced into Mexico by the Spaniards in 1520, and is said to have destroyed 3,500,000 people; in some places whole tribes were wiped out.

In 1707, smallpox was introduced into Iceland, where it apparently had never existed before. Eighteen thousand out of 50,000 died of the disease.

From the fifteenth to the seventeenth century, it was practically universally present in most of the large cities over the known world. The epidemology resembled measles of the present day. No class of society was exempt. The king on his throne and the peasant in his hut were equally liable to the contagion. The question asked in the industrial world was "Have you had your smallpox?" just as today we ask "Have you been vaccinated?"

There was a high smallpox death rate in all large cities at that time. Dr. Farr estimated deaths from variola in the eighteenth century at about 4000 per million. Sir Lyon Playfair's estimate for all England was 3000 deaths per million, and it is calculated that about one-twelfth of the total mortality from all causes was due to smallpox. Smallpox was preéminently a disease of childhood. In Berlin from 1758-74 6000 deaths were reported, and only about 45 over 15 years of age, or one in 147 deaths.

Facts of this character could be presented almost without number, showing

*Report of a lecture delivered to the Philadelphia Branch, May 7, 1912.

first, the enormous loss of life due to the disease; second, that the disease was very largely confined to children.

In discussing the disease at the present time, previous conditions must be borne in mind or we will fail to realize that some potent factor is responsible for what would otherwise be a marvelous change in the epidemology of the disease.

It would be interesting at this point to enter into a discussion of the question of immunity underlying the whole subject of vaccination which was first exemplified in the attempt to prevent smallpox; but time does not permit. Suffice it to say that various theories have been advanced by Pasteur, Chauveau, Metchnikoff, Bucher, Nutall, Behring, Roux, Ehrlich, Wright, Wasserman and others, each in turn being in a measure superseded by the others, but all throwing light on this vexed question, until at the present time we are in a position to say that acquired immunity *to a contagious disease* depends upon a more or less profound impression made upon a higher organism by products thrown off by the micro-organisms, causing a specific disease. These products are proteids chemically, and the action appears to be a physiologic-chemical one, whereby the exciting poison, or antigen, stimulates the cells of the host to an antagonistic reaction. This reaction is largely specific and is directed to the protection of the host from the specific disease engendered by the invading microbe. In the light of this definition of "immunity", I will briefly sketch the methods employed to immunize against smallpox.

Inoculation.—In 1717 Lady Mary Worley Montague, wife of the British ambassador to Turkey, wrote a letter to a friend in England, describing the method of conferring artificial immunity used in Turkey known as "protection by inoculation," being nothing more or less than taking smallpox virus from a diseased person suffering with a mild type, *and inoculating* into a well person, thus conferring upon him a slight attack of the disease. This method continued in use in England for a number of years and spread over the most of Europe. It was never popular, however, with the peasant class. It was open to the objection in that while it conferred immunity, patients sometimes died. It was likewise probably one of the most potent factors in spreading the disease, since a person contracting smallpox by inoculation was just as liable to spread the contagion as one who took it in the natural way. It was prohibited in England by act of parliament in 1840.

Introduction of Cow-pox.—In the early part of the seventeenth century, several observers noted a tradition in the dairy districts to the effect that persons who had become infected with a localized skin eruption known as "cow-pox" from milking or handling cattle, were immune to smallpox.

Dr. Fewster, of Gloucester, in 1765 seems to have sent a paper to the Medical Society of London, indicating that inoculation failed in persons previously affected with cow-pox.

In 1774, a farmer, Benjamin Jetsy, of Dorsetshire, vaccinated his wife and two sons with this virus. Fifteen years later, one of the sons was inoculated with smallpox virus with negative result. This tradition seems also to have been known in Germany, Italy, the South of France, Holland, and elsewhere,

but nothing of a practical nature was accomplished until Edward Jenner took up the question and made a scientific study of it.

DR. EDWARD JENNER,
Discoverer of Vaccination.

Jenner studied medicine under the celebrated John Hunter, of London, and began practice near Berkley, where he came in contact with this tradition. So impressed was he that he made a number of experiments, inoculating people who had had cow-pox with smallpox, and finally on the fourteenth day of May, 1796 (known as the birthday of vaccination) he inoculated a boy—James Phipps—with a sore from the hand of a milkmaid who had accidently been infected with cow-pox. A successful vaccination resulted, and a few weeks later he inoculated the same boy with fresh smallpox lymph, without results. So thoroughly was he satisfied with the results of these experiments, that he reported them to the Royal Society in June, 1798, in a paper entitled, "An Inquiry into the Cause and Effects of the Variolæ Vaccinæ, a Disease Discovered in some of the Western Counties of England, particularly Gloucestershire, and known by the name of Cow-pox."

This method of protection was tried out in a number of hospitals. Thus in 1802 Dr. Woodville reported that he vaccinated 7500, about one-half of whom were afterwards inoculated with smallpox without results.

On October 31, 1802, King Frederick William of Germany stated that the Medical College had reported 17,741 carefully observed vaccinations, of which 8000 were subsequently tested by inoculation.

Dr. Waterhouse, of Boston, received a small supply of virus from Jenner, and vaccination began in this country in 1802.

Early Method of Propagating and Preparing Virus.—As it is well known, the early methods of obtaining virus was known as the "arm to arm" method; that is, a child in healthy condition was vaccinated, and on about the eighth (?) day when the vesicle was considered "ripe," a small part of the clear lymph was taken, and put up in capillary tubes or charged on ivory points for the routine vaccination of that particular district. This method was used in England until about 1898, when it was largely superseded by the glycerinated virus.

In this country we first used what is known as the "scab method." A child was vaccinated and when the scab dropped off, it was wrapped up in beeswax or other impervious material until required. It is reported that this virus could be kept for some time, even as long as several months, and still remain active. Objections to these methods were raised by anti-vaccinationists and others, because of the possibility of conveying some disease other than vaccinia. A few cases of syphilis were undoubtedly transmitted in this way.

In 1842 Negri seems to have modified the method introduced by Galbiati of inoculating the virus from one calf to another to obtain material for human vaccination.

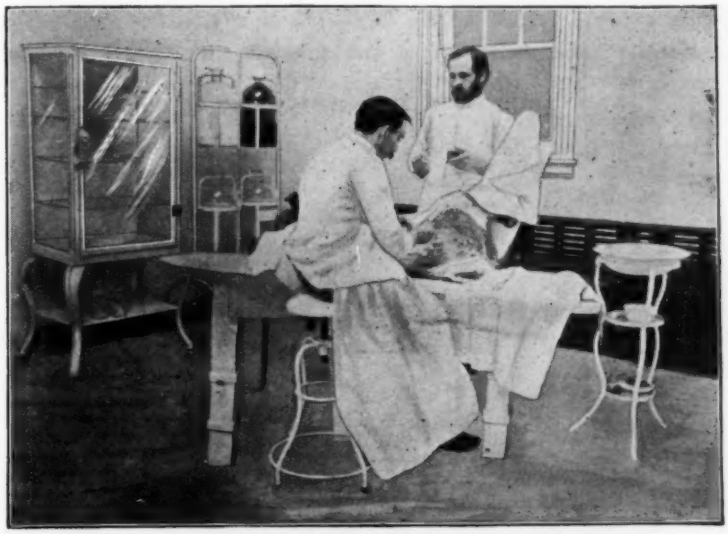
In 1870 Dr. Martin, of Boston, introduced this method in the United States. Crusts taken from the calf were then used. After this goose quills roughened on an emery-wheel were dipped into the pock on the animal and these were employed for the purpose of vaccinating.

This was followed some years later by the ivory points. These were made from ivory chips, a by-product of ivory manufacturers. The objection to all of these forms was that the virus was always contaminated.

My first experience when beginning the work some twenty years ago may be briefly summarized as follows:

Stables—rough sheds, white-washed once or twice a year, with animal refuse over everything. Corn stalks and manure from six to eighteen inches deep.

Animals—small calves, inoculated in small squares on the abdomen, and crusts removed on third or fourth day, amid fœcal accumulation, and filth with prac-



A Modern Vaccine Laboratory.

tically no attention to cleanliness. This underlying pus was charged on ivory points with soiled brushes and hands; in fact the whole picture was unthinkable when viewed from the standpoint of our present knowledge.

Insofar as I have been able to learn, these were the normal conditions at practically all vaccine plants at that time.

Virus had to be removed on the third to fifth day or the putrifying odor became offensive. Necrosis of tissue only was noted, and because this necrotic process was more rapid than vaccinia and usually entirely overshadowed it, the normal lesions of vaccinia were rarely observed, and we did not know at times whether vaccinia was present or not.

In 1898 Monckton Copeman delivered his Milroy Lectures, dealing with vaccine virus, and the results of some experiments with the admixture of glycerin with the virus, showing how virus was purified by this method.

Copeman was, however, not the fiirst to mix glycerin with vaccine virus.

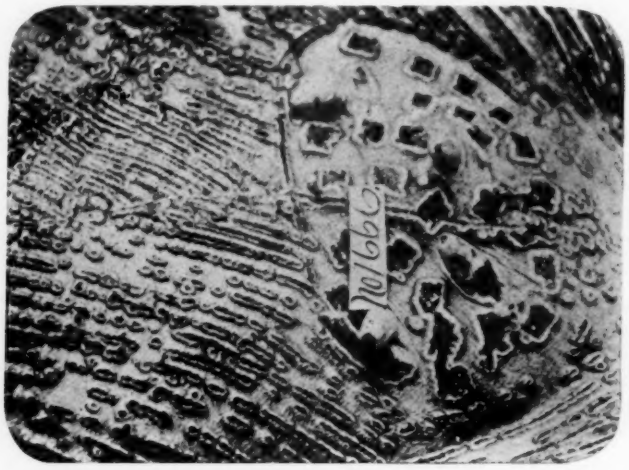
Müller of Berlin had done this for quite a while in order to increase the bulk of the virus and to act as a preservative. He did not seem to appreciate, however, the purifying effect of this method.

Koke reported somewhere about 1887 that the number of extraneous organisms decreased in the glycerinated lymph. He seems to have missed the importance of this statement because he stopped just at this point.

On a visit to Rome some years ago, I called the attention of Prof. Leoni to these facts and he stated that he had begun a line of investigations in December, 1888, looking to the purification of virus by this method, and had published his results in 1890, about one year before Copeman's publication.

Investigations of these observers and others prove that when from 50 to 60% of glycerin is added to the virus taken from the animal and allowed to remain under certain conditions for varying periods of time, a large reduction of non-spore forming germs can be noted from week to week.

The Reasons for Using Glycerin with Vaccine Virus.—You will note from what has already been said that at the present time glycerin and water are



Developed Vesicles on Vaccinated Calf.

mixed with the virus in about the proportion of 60% for the dual purpose of first, as a preservative; second, for purification.

As previously noted, this work was described by Copeman in his Milroy Lectures in 1898, and I immediately began investigating the properties of glycerin with virus; it was only after two years work that I could convince myself that virus submitted to this treatment would remain active the length of time described by Copeman; and in fact, after we had begun the work at Glenolden, several facts developed for which we could not account on the theory that glycerin preserved the vaccine at the same time destroying bacteria.

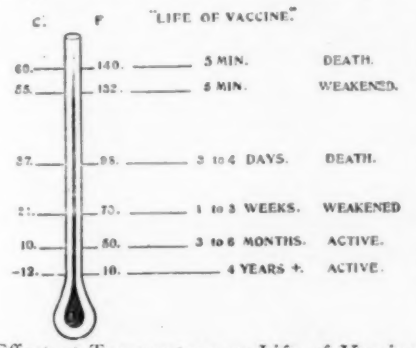
During the summer numerous complaints were reported where the vaccine did not give the expected results. Further experiments demonstrated the fact that heat was an important factor, causing the destruction of bacteria and at the same time destroying the virulence of the vaccine. In other words, the temperature of

the ice chest where the material was stored was one of the most important facts to be considered.

You will note the curved line marking the point of destruction of germ life crosses the life-line of vaccine in the summer season. In other words, virus sent out during this time of year will not stay active as long as the germ content. At the time this experiment was made, we kept virus in this laboratory under ordinary ice-chest temperature, and found that the germ life and the life of the virus were practically destroyed. The only way that we have been able to overcome this during this season of the year, and at the same time prepare a safe virus, is not to undertake to destroy germ life, but to test for the virulence of the germ life from week to week until it is no longer pathogenic.

Please remember that these experiments were made before the introduction of the cold storage method of keeping virus.

The experiments showing the importance of cold storage to vaccine production may best be illustrated in this slide.



Effect of Temperature on Life of Vaccine.

Taking the same virus and subjecting it to different temperatures, we have found that 60° C. killed virus in 5 minutes.

55° C. weakened it so we can note degeneration in the vesicles produced.

At 37° C. the virus will last from 3 to 4 days.

At 21° C., which we regard as practically room temperature, from 1 to 3 weeks showed deterioration of the product.

At 10° C., which is the usual ice-chest temperature, the virus will stand for three months or longer, occasionally as long as a year.

At —12° C. we have kept it four years, and it remained in good condition after being removed and subjected to ordinary ice-chest temperature. You can now understand the importance of this second factor to the preservation of virus.

This work was done at our laboratory after encountering the difficulty with the method discussed by Copeman in applying it to conditions of extreme summer heat, long shipping distances, long dating. Experiments were begun in 1899 and the first report regarding this was made at the American Public Health Association in 1900.

Shortly after this Blaxall began investigation, and reported to the Local Government Board and confirmed it in 1907; however, I am sorry to say, without any recognition of the work done in America.

Tubes of virus were placed at the temperatures noted before, and removed at stated periods, the virus plated and the number of colonies noted. From this you will see that the temperature of 60 degrees killed the non-spore contained bacteria in 30 minutes.

A temperature of 55° C. left less than 69 colonies.

A temperature of 37°, after an exposure of 3 days, left only one colony.

A temperature of 21° C. exposure of 5 weeks, before it was cleaned up plating, week by week.

A temperature of 10° C., exposure 9 weeks, before bacteria were entirely cleaned out.

At —12° C. we have never been able to clean up bacteria—in fact the virulence of staphylococcus was isolated from vaccine after four years and inoculated into a rabbit, causing the death of the animal.

As has been observed from slides previously shown, it is impossible to destroy all of the non-spore bacteria in glycerinated virus, because of the close relation between the life of the virus and the life of bacteria, in other words, because the virus itself is so near the death point when bacteria are eliminated as to be practically worthless when it leaves the laboratory and reaches the hands of the consumer.

For quite a while we did not recognize this, and as a result, numerous complaints were registered against the virus during the summer season, when it was extremely important that active vaccine should be in the hands of those having the field work to do. This method was then abandoned, and in its place we determined to attentuate the pathogenic contaminating organisms rather than attempt their total destruction. This method may be described as follows:

"Virus is put in the ice-chest at a temperature approximately 12° C. and held there until such a time that it is believed the contaminated organisms are rendered harmless, although not necessarily destroyed. Large numbers of them, however, are destroyed as shown by plate culture taken from day to day. Probably the more active ones remain, but these lose their virulence before the testing point is reached. At this time plate cultures are made and staphylococci and streptococci isolated; bouillon cultures are made of these and kept in the incubator for 24 hours and then injected intravenously into a rabbit in quantities of 1 c. c. to each 1000 grams of body weight of the animal.

These animals are kept under observation for a week, the weight taken every other day, and at the end of this time they are killed and cultures made. If any lesion is noted that may be caused by these organisms the virus is again placed in the ice-chest at the temperature of 12° C. for a week longer, and the process repeated. If any other suspicious organism is found, similar methods are used to determine its pathogenicity.

Anaerobes.—As is well known to the most of you, the tests which I have already suggested are only possible with organisms which grow in the air. Any anærobic organism which might be in the virus could not be determined by this method. Because of the fact that tetanus has followed the use of vaccine very careful testing is done to determine the absence of this organism.

Tetanus being a very powerful toxine producer, the test is comparatively easy. Our method is as follows:

10 c. c. of the virus to be tested is placed on bouillon in a modified Smith tube, allowed to grow for 10 days at incubator temperature, at the end of which period a culture is made on a slide for microscopic investigation. The culture is then filtered in order that the germ life may be taken out while the toxin itself passes through the filter.

5 c. c. of this filtrate is inoculated into a guinea pig and the animal is kept under observation, and must remain alive for 14 days before the experiment is considered satisfactory.

In addition to this 2 c. c. of the crude virus is injected into a guinea pig which is also kept under observation for at least 10 days to see if anything develops other than vaccinia. This work with slight variation as to technique, I have reasons to believe is carried on by all laboratories propagating vaccine virus, and you can readily recognize its importance when you recall the fact that for the past 10 years an occasional report of tetanus following vaccination has been noted from year to year. It is natural to suppose that the virus was responsible for this condition, and yet the investigations made by the number of laboratories in the last 10 years, both experimental and as a routine procedure, have failed to determine the presence of the tetnaus germ in any sample examined in this country, as reported by the Committee on Vaccine at the American Public Health Association meeting in Richmond in '08. At that time there had been 5,800 tests made and possibly the number by this time is nearly double.

The only time that the tetanus germ has been reported in vaccine virus was by Carini of Berne, and the possible case of Dr. Robt. N. Willson of Philadelphia. Dr. Willson, however, is not sure that he found the organism.

Attention is simply called to this matter because of its importance to persons responsible for vaccinating and the after care of the vesicle. Tetanus is probably more prevalent in the eastern part of the United States than in former years. It is possible that the wound may be contaminated with the dust from the streets, in fact any wound whether from vaccination or not may be contaminated and tetanus follow.

In concluding this section, I wish to make some practical suggestions to those handling and using virus that may be of value.

The United States Government requires a date to be placed on biological products giving the supposed minimum of the length of activity. From what has been said you can readily see that this is entirely problematical in a given sample, because no one knows the temperature conditions through which it is required to pass before it reaches the hands of the consumer, nor can we say how it is going to be stored when in the local drug stores.

You have seen that it can be killed very quickly by high temperatures, while below 0° C. it remains active for an undetermined period.

Therefore vaccine should never be kept in stock in a drug store (except in very small quantities) or any other place outside of the laboratory except below freezing point, which is usually impossible except in the dead of winter. The rule is that virus should never be kept in the summer season for local distribution, excepting it is to be used immediately.

Order in small quantities and order often and better results will be obtained.

Again I wish to call your attention to an error made by ordering routine vaccination for Public School purposes in September.

We are compelled to put up the virus in the summer months and ship it in the heat of August and September, and as a result it is frequently worthless when used.

The Doctor, if conscientious, has to do his work over several times before getting the desired results, or the patient has to go to school vaccinated but not protected, because the virus did not take.

Immunity Conferred by Vaccination.—In the first place permit me to call attention to the fact that the Local Government Board of Great Britain require three separate and distinct vaccinations and claims it takes at least one-half square inch of vaccinated surface to afford complete and lasting immunity.

It is the custom of the United States to vaccinate at but one point; frequently this is sufficiently large to cover the requirements previously indicated.

Supposing that a person has been vaccinated to the point of saturation then the question is asked—how long will this protect against small-pox? We must not forget in attempting to answer this question, there are no two persons equally susceptible to any disease; in other words that the amount of natural immunity varies with the individual.

We must be guided by some rule in our work and in order to establish some basis for comparison, I have devised this chart.

You see, it stated in almost all literature on the question, that when a person is vaccinated in infancy and again at 10 or 12 years of age, the protection usually stands during life.

How true this may be in reference to smallpox, I do not know, but I know it is not true in reference to vaccination. Over and over again I have seen employes in our laboratory get a vaccine infection in almost any part of their body which happened to be scratched and was exposed when handling the virus, which vaccination may be repeated in three months' time, or in a year or longer.

I have seen some individuals who seem to be impervious to the disease altogether, yet if they continued handling the vaccine year after year a time will come when the natural immunity is at low ebb and the person will take the infection.

PRECAUTIONS TO BE OBSERVED IN STORING VACCINES FOR DISTRIBUTION.*

W. L. CLIFFE.

The part assigned to me in the discussion of this evening relates entirely to the functions of the retail pharmacist as a distributor of these products upon the prescription or requisition of the medical practitioner.

As a distributor of Biologic Preparations the retail pharmacist has a much more important part than he is generally credited with or even than the majority of pharmacists appreciate. Owing to the high grade of technical skill and the large

*Read before the Philadelphia Branch, May 7, 1912.

capital required for the maintenance of a plant it is not likely that manufacturing establishments will be generally located near enough to the physician for him to be able to obtain his supplies direct from the maker without the intervention of the pharmacist as a distributor.

The time that would elapse in procuring the antitoxic serum or even the vaccine from the maker, notwithstanding modern methods of communication and transportation, would be serious and detrimental in most cases.

It therefore becomes a necessity to have supplies at hand in each locality, and logically and naturally the pharmacist is the recognized distributor.

To fully consider the responsibilities of the situation and the necessary precautions entailed upon the purveyor of this class of products is important for the pharmacist who intends handling serums and vaccines.

Ever since they were first produced there has been no material disagreement among experts that light, air and temperature are the important factors in the preservation and storage of this class of products, and the Pharmacopœia fully recognizes these principles in its directions for the preservation of Serum Antidiphthericum, the only one official, which is as follows: "It should be kept in sealed glass containers in a dark place at temperatures between 4.5 and 15 degrees Centigrade (40° to 50° F.)" Two of these factors, in so far as the distributor is concerned, have been cleverly controlled and eliminated by the makers, who have generally adopted packages consisting of either ampoules, or ampoules convertible into syringes which are packed in light-proof containers.

The third factor, or that of temperature, is therefore the one that is important for the distributor, and it may be tersely stated that it is useless for the pharmacist to attempt to handle this class of preparations who does not have a refrigerator and maintain in it a temperature of somewhere near 10 degrees Centigrade (50° F.) with a range of not more than ten degrees Fahrenheit or about 5 degrees Centigrade, either way.

It does not necessarily follow that the equipment must be elaborate or expensive, and there are a number of types of refrigerators on the market that are well adapted for the purpose. One of the best and easiest kept clean is made from thin plates of enamelled steel in both square and cylindrical shapes and of convenient sizes. The writer has found one of this type perfectly satisfactory and capable of maintaining on the average a temperature of about 50 degrees Fahrenheit under ordinary store conditions.

Another important matter is the question of age, but as the relation of age to efficiency has been pretty thoroughly worked out, and as every maker sends out his package with the limit of time for use plainly stated thereon, the only obligation upon the distributor is to dispense products within the time limit.

In this connection, it should be remembered that this time limit involves storage under prescribed conditions, and that deviation from what is recognized as a necessity in the situation can bring about a condition in the product that makes the time limit of no value whatever as an index to efficiency.

THE ARGUMENTS OF ANTIVACCINISTS AND THE MEASURE OF TRUTH AND ERROR CONTAINED THEREIN.*

JAY F. SCHAMBERG, M. D., PHILADELPHIA.

In 1798, Jenner announced to the world a means of staying the ravages of the dreaded disease, smallpox. In order to appreciate the importance of this discovery at that time, it is essential to know how extensive and fatal a disease smallpox was. We have accurate records of the number of smallpox deaths in the city of London from about the middle of the seventeenth century to the present time. The London Bills of Mortality show that in the eighteenth century, London, with a population varying between 500,000 and 750,000 had approximately 10,000 cases of smallpox a year. About one-fifth or one-sixth of the persons attacked succumbed to the disease. In 1721, the practice of inoculation of smallpox was introduced into England by Lady Wortley Montague.

The opponents of vaccination contend that the decline of smallpox mortality, which was noted in practically all countries about the beginning of the nineteenth century, was not due to the introduction of vaccination but to the discontinuance of inoculation. They claim that the smallpox death rate was increased throughout the eighteenth century by inoculation. Statistics show, however, that smallpox caused about one-twelfth of all deaths in the beginning of the eighteenth century before inoculation was introduced, and one-eleventh of all deaths toward the end of the century. So that the mortality from smallpox did not in any marked degree differ in the two periods. Smallpox was constantly increasing from the middle of the seventeenth century up to 1720, with no such factor as inoculation to account for it. It must be admitted that inoculation did tend to perpetuate smallpox, because inoculated smallpox, while saving the lives of thousands who were subjected to this procedure, could be readily caught in the ordinary way by those who were unprotected. Only one person in about a hundred would die of inoculated smallpox. As every one felt that he would have to suffer from smallpox at one or another period of his life, it was deemed desirable to take a small risk in order to be saved from a much greater peril.

Inoculated smallpox had two effects: It caused an enormous saving of life among those who were inoculated; it tended also to disseminate the disease. There were, therefore, two factors operative which practically neutralized each other as far as the influence of smallpox mortality was concerned. In every civilized country we note at the beginning of the eighteenth century a decline in smallpox mortality coincident with the introduction of vaccination.

I might remark, as indicating the prevalence of smallpox in the pre-vaccination era, that in certain cities and towns at various times, smallpox was so prevalent that 85 to 90 per cent of the people passed through the disease at some period of their lives.

It has been repeatedly urged by the antivaccinists that smallpox occurs among

*An address before the Philadelphia Branch of the American Pharmaceutical Association, May 7, 1912.

the vaccinated: no one claims at the present day that a single vaccination in infancy will in the majority of cases protect against smallpox for life; exceptionally, however, this does occur. On an average, vaccination will protect for a period of seven to ten years. A successful revaccination at the end of this tmie usually confers protection for life.

Shortly after Jenner announced the discovery of vaccination, the procedure was taken up, among others, by Dr. Woodville, the physician in charge of the London smallpox hospital. He employed it upon persons in the hospital, and it was subsequently found that some of those vaccinated at the same time contracted smallpox through the air. Much of this virus was sent out as vaccine virus and gave rise to inoculated smallpox. Dr. Crookshank, of England, the most scientific of the opponents of vaccination, has advanced the view that practically all of the virus sent broadcast by Jenner was in reality an attenuated smallpox virus, and that the "vaccinations" performed were in reality "variolations," although general eruptions were not produced by the virus. I may say that eleven of the thirteen surviving members of the British Royal Commission on Vaccination in their report published in 1896, were not of this opinion.

Crookshank endeavored, by his argument, to prove that the persons who were presumably inoculated with cowpox were protected against subsequent smallpox inoculation and purposeful exposure to the disease because they had been in reality "variolated."

It is claimed by some antivaccinists that our "vaccinations" at the present day are in the main "variolations." There is absolutely no proof of such a contention.

Vaccine virus may be made, and is indeed sometimes so generated, by inoculating calves with smallpox virus. After it has passed through three generations of the bovine species, it is completely and permanently transmuted into vaccine virus.

Now we come to an argument which is advanced by some of the most radical of the opponents of vaccination, namely, that vaccination actually spreads smallpox; this is based upon the assumption that vaccine virus which may originally have been derived from smallpox, may through some particular susceptibility of the subject vaccinated, revert back to its original nature and produce smallpox. This is an entirely gratuitous assumption which is made without any basis in fact. I need only mention the fact that variola-vaccine (i. e., lymph of smallpox ancestry) has been used more extensively in Germany than in any other country. Of all the great countries of the world, Germany is the one which has had the least smallpox during the past twenty-one years.

The two main arguments of the opponents of vaccination are that vaccination does not protect against smallpox, and that it is injurious. A study of the statistics of the protective influence of vaccination against smallpox during the past century leads convincingly to the conclusion that vaccination does protect against smallpox. Time will not permit me to discuss this subject at length, but I can not refrain from mentioning the case with regard to Germany. Since 1875, Germany has had compulsory vaccination in infancy and compulsory revaccination at the age of twelve, with a third vaccination among the men who enter the army. There is no country in the world at the present time where

vaccination is so thoroughly carried out. Not only has Germany a vaccination law as ideal as can be framed, but there is, moreover, a most thorough administration of the law. This does not mean that there are not thousands of unvaccinated people in Germany; there are always some thousands of children who are below the age of vaccination. There are those postponements of vaccination due to physical disability. Nevertheless, if we consult official publications, we find that in the twenty years between 1889 and 1908, England and Wales have had about eight times as great a smallpox mortality as Germany.

In proportion to the population of the two countries, we find that England and Wales have had 13½ times as many smallpox deaths as Germany. England has a vaccination law requiring only vaccination in infancy, and this law has been greatly weakened in its effect by exemptions under the "conscience clause." The discrepancy is still all the more remarkable considering the wonderful natural isolation of England and the exposed position of Germany, surrounded, as she is, by countries in which smallpox is very prevalent. Russia, for instance, in 60 to 70 millions of her population has 39,000 deaths annually from smallpox. Germany has a population today of over sixty-four millions and averages about 53 smallpox deaths a year. It is asserted by the opponents of vaccination that the hygienic and sanitary conditions in Germany are better than those in England. The proof that this statement is false is evident from the comparative general death rates of the two countries. England has and has always had a considerably lower general death rate than Germany, so that whereas the general death rate from all diseases is higher in Germany than it is in England and Wales, the smallpox death rate is infinitely lower.

It is asserted by the opponents of vaccination that sanitation is responsible for the general decrease in smallpox. No one here would attempt to deny that sanitation plays a part in the decrease of all infectious diseases. But we insist that such sanitary reforms as improvement in water supply, in drainage, in ventilation, etc., have little or nothing to do with the prevalence of smallpox.

Personal susceptibility is the dominant factor. Such sanitary measures as the prompt isolation of the patient, expeditious quarantine of those who have been in contact, and subsequent disinfection of premises must exert an important influence upon the limitation of the spread of smallpox, and is, of course, practiced by all vigilant health services.

The other main argument against vaccination is that it is injurious. It is held that the best protection against disease is health and that to inoculate any disease into the system is a blunder. As a pure academic proposition, this hypothesis seems reasonable, but when we find as an actual matter of experience that the inoculation of the system with a mild disease which produces an absolutely insignificant mortality confers protection against a loathsome disease which kills, disfigures and causes blindness, we would exhibit but little intelligence if we did not accept the benefits of such a procedure. When smallpox prevails, people become panic stricken and rush to be vaccinated.

It has been urged that vaccination has caused syphilis. It is admitted that arm-to-arm vaccination with humanized virus has, in extremely rare instances, transmitted syphilis from one child to another. With the employment of bovine

lymph, such as is universally employed in this country today, such an argument loses all force, inasmuch as the bovine is not susceptible to syphilis. It has been urged that tuberculosis may be disseminated by the use of bovine lymph. This is another of the gratuitous assumptions of the opponents of vaccination. Not only is tuberculosis of the greatest rarity in young calves, but they are thoroughly tested with tuberculin before being used. Furthermore, the calf is autopsied before the lymph is placed upon the market. Even if tubercle bacilli were intentionally placed in the lymph, they woud be destroyed by the glycerin, as has been proven by S. Monckton Copeman, of England. Finally, if tubercle bacilli were actually inoculated on the skin of a person, nothing more would result in the vast majority of cases, than a local skin affection.

It is urged by the opponents of vaccination that tetanus is commonly introduced with vaccine lymph. I can not go into a detailed discussion of this allegation. I merely wish to call attention to the statement made by Dr. Elgin that some 5,800 tests have been made without any tetanus organisms having been found. I believe very strongly that nearly all, if not all cases of tetanus occurring after vaccination, have been due to accidental inoculation of the site of vaccination as a result of uncleanliness and maltreatment of the wound. These accidents will doubtless be prevented as improved technic is brought about,

The statistics of the Philippines within recent years with relation to vaccination and smallpox are most enlightening. Millions of vaccinations have been performed in the Philippine Islands by the United States authorities, with the result that smallpox mortality has been enormously reduced and the disease in many localities completely stamped out.

In conclusion, permit me to quote from a letter sent to Jenner in 1806 by Thomas Jefferson, then President of the United States: "You have erased from the calendar of human afflictions one of its greatest. Yours is the comfortable reflection that mankind can never forget that you lived. Future nations will know by history only that the dreaded smallpox has existed and by you has been extirpated." I may say that this prediction only fails of being a prophecy because vaccination and revaccination are not universally employed throughout the land.

DISCUSSION.

PROFESSOR MACFARLAND: "I have just one single thought which bears somewhat indirectly on the whole subject and yet calls to mind certain facts that many people seem to forget in this matter of explanation of the contamination of smallpox depending upon sanitary conditions.

"I wonder how many people are perfectly acquainted with the housing conditions of Philadelphia. I was very much surprised myself, although I knew they were not what they should be, after a talk with Dr. Abbott of the University of Pennsylvania upon this subject some time ago. I knew that many houses in Philadelphia were old, I knew in my own family there were houses that had been built by my great grandfather, and that these houses at the present time are in about the same conditions they were then, but it did not occur to me until I talked with Dr. Abbott that what was true of these old houses in Philadelphia is true of more than forty thousand other houses which at the present time are in precisely the same conditions they were from 75 to 125 years ago. There are 40,000 (?) houses in Philadelphia that have no sewer connections, that have cesspools in the back yards.

"My grandfather was born in 1819, and he told me that when he was a child he was vacci-

nated, but some of his brothers who were not had smallpox. He said that in his day nobody paid very much attention to smallpox. Those people lived in the same houses and in very much the same way in which people live today, so that if there were better hygiene, it cannot be the method of living; if it were better drainage, it cannot apply. If it referred to the number of people in the houses it would not apply, because the number of people in these old houses is in excess of what it was."

DR. WADSWORTH: "The pharmacist comes in contact with the people in a very peculiar way. The pharmacist should understand this is a very serious matter. Is it the duty of a sane man, and I am not talking to any others, to sit down and deny such facts? It is our business as sane, intelligent members of this community to say, if there is a mistake here or a mistake there which brings a danger to a good thing, let us go after that danger, but don't let us block the wheels of progress.

"You asked me about my experience. I do everything I can to investigate matters, and if I can find any mistake, I am going to find it. I have been sent out on a number of these cases of tetanus. I don't think I have been unfair, but when I find a child vaccinated on a certain day, gets along nicely, and the child not being particularly healthy is sent to the country, goes up on the hills, plays out in the yard, gets dirt on the vaccination scab, and two days after that develops a pus infection of the arm, then ten days after that develops tetanus.

"It takes me two weeks of hard digging to find out the facts, but when I find them, I am rather inclined to believe that this is a dirt infection.

"Whenever I have a chance, I stand up and say keep dirt out of vaccination wounds. Don't get hysterical when you are doing the work of the community or when you are thinking for yourself, but use your common sound sense and say, keep dirt out of vaccination wounds. If that one had been protected as an open wound as it should have been, the chances are that the chlld would not have got tetanus.

"There is another argument which has been brought up in regard to vaccination, that you should not use animals for experimentation. But when a race that has been supposed to be Christian and follows the lead of the Master who said that not one sparrow falls to the ground that your Heavenly Father does not know it, ye are of more value than many sparrows—you have your religious doctrine for it and it is the finest expression for vivisection that has ever been put in any platform anywhere.

"There is only one thought I want to add further and that is that as far as possible you keep a record of the packages of vaccine lymph sold; and to whom delivered, so that we may eliminate the undesirable features. Then if there has been a mistake, we can go through it and have it corrected. There is nobody more anxious than the straightforward manufacturer to have every error corrected, and he will meet you more than half way and lay his books before you, if you will help in this way by registering every bit of lymph you have come in. It is not much work for you and it helps materially in the investigation."

DR. ROYER: "I am specially glad to hear the splendid lecture by Dr. Elgin and to hear Dr. Hitchens on the preparation of vaccines, but I was more impressed by the importance attached to the proper storage of vaccine virus by Dr. Cliffe, than by the earlier papers in the evening, because I think that is a point where pharmacists very often fail, and we can't impress upon them too strongly that vaccine virus must be stored in a cool place. In fact, I think the producers are a little at fault in this way. They should stamp on every package they ship to pharmacists that this product is perishable unless stored in a refrigerator, because I am sure many pharmacists have not grasped fully the importance of storing vaccine virus in a proper place.

"The first thing I do in going into a pharmacy for vaccine is to find where that virus was stored. It is absolutely essential because you may get virus that has not been properly stored and is no longer active. You give that poor unfortunate individual a false sense of security. Many of the failures, most of them I think, are due just to that sort of thing—bad storage of virus—and it is especially important in the two seasons of the year,—in the winter season when your drug store is superheated and during the hot season.

"I have had an opportunity of testing out the virus of nearly all the large manufacturers of the country. I perhaps have vaccinated under my personal supervision between six and

seven thousand people, most of them children, and I have yet to see the bad results that are reported by those who oppose vaccination.

"Anyone who has seen the effect of vaccination, as a worker in a smallpox hospital, cannot but be convinced that vaccination ought to be practiced everywhere."

DR. ROUSSELL: "The preparation of the arm for vaccination is an important point. The use of antiseptic solutions on the arm improperly cleansed with water will prevent the action of the vaccine. I find out, after considerable experience, and also teach my class, no matter what antiseptic they use, be careful to see that you have afterwards washed off any remains of it.

"I would like to call attention to the advantage of the European method of vaccinating at two or three or more points. I am quite satisfied that the use of a single vaccination may be effective in most cases, occasionally it would seem that a successful vaccination has been followed, within a comparatively short time, by smallpox. That is possibly in two or three cases.

"More often very sore arms are simply proof of infection and not of successful vaccination. The vaccination has to go through a regular course, in order to insure a perfectly successful vaccination, and physicians may be misled by accepting large inflammation as proof of a successful vaccination."

DR. WELCH: "Referring to the statement I made in reference to vaccination in the Philippines, I would say that while we did clean up these towns in addition to the vaccination, when I returned to the town after a few years the sanitary conditions were the same as they had been before, but there was no smallpox.

"In reference to smallpox in the army in the Philippines, there were several reasons; in the first place, smallpox follows an army. In the United States army in the Philippines, there were a great many men who had not been vaccinated. These men were volunteers. We also discovered, as I told this gentleman a short time ago, that the vaccine virus was found inert on account of climatic conditions. It had been used for quite a while before they discovered that fact.

"I would also say in reference to Japan, that the laws were not enforced for a long time."

PARCELS POST AND A MAIL-ORDER TRUST.

Advocates of Parcels Post have been calling wholesale and retail merchants parasites upon our economic system. Edward B. Moon, Secretary of the American League of Associations, demonstrated that the wholesaler enabled the manufacturer to use capital in production which otherwise he must employ in marketing his products that the wholesaler by taking a consignment of manufactured goods frequently finances a meritorious struggling industry; and that his extension of credits to the retailer enables the retailer to credit his patrons. To bring the country suddenly to a cash basis, necessary if concentrated in great retail mail-order centers, would work hardship. He showed that the profits of these retail mail-order houses were usually greater than those of wholesaler and retailer combined and that, if present methods of trade distribution were destroyed through Parcels Post, the country might look for a trust of great retail mail-order houses.

Congressman Hill of Connecticut says: "If Parcels Post be established, the yearly deficit on that would be one hundred and fifty million dollars. Yet the advocates of parcels post will not compromise. They don't want to experiment; they want to go the limit."—*Rocky Mountain Druggist.*

Section on Scientific Papers

Papers Presented at the Fifty-Ninth Convention

PHYSIOLOGICAL DRUG TESTING AND THE PHARMACOPOEIA.

CHAS. C. HASKELL, A. B., MD.

The chemical assay of aconite, cannabis indica, ergot, and the "heart tonics" is not practicable. In view of the great importance of some of these drugs, the attempt has been made to standardize them by tests upon the lower animals. That methods of physiological drug testing are of undoubted value is generally admitted, but that by these methods sufficient accuracy is secured to warrant their adoption as official methods of assay is not so universally believed. It has seemed to me that a discussion of physiological assaying as related to the Pharmacopoeia is particularly appropriate at this time.

Roughly, the methods of physiological testing of drugs may be divided into two classes. In the first of these, a determination is made of the amount of drug necessary to cause the death of an animal; in other words, we endeavor to ascertain the killing power of the particular drug. In the second class, the attempt is made to measure the effect of the drug upon the function of living tissue.

It would seem, on theoretical grounds, that the methods based upon the determination of the lethal dose are less likely to give reliable results than are those methods where the attempt is made to measure some peculiar physiological action of a drug; some action which has been shown clinically to be of therapeutic value. If, however, it is proven that the lethal action is always due to the therapeutically active principles and that the action is always upon the same vital centers, then this theoretical objection is removed. Until then, however, as has already been pointed out, simply because one specimen of drug is twice as poisonous as a second gives us no reason for assuming that the former is twice as active therapeutically as the latter.

The prime requisite for any method of assay is, of course, accuracy. The degree of accuracy being the same, methods showing cheapness, simplicity and rapidity are to be preferred and it will be of value for us to keep these points constantly in mind.

For the assay of aconite, two methods have been proposed. The first of these belongs to class two of the arbitrary division, and depends upon the fact that aconite has the property of so stimulating sensory nerve terminals as to cause a tingling sensation. Dr. Squibb endeavored to learn at how great dilution an aconite preparation was still capable of causing this sensory reaction when the solution was held is the mouth.

The other method is simply a lethal dose method; guinea pigs, frogs or other animals being used in the experiments.

Dr. Squibb's method is unsatisfactory because the personal equation is apt to influence the results. A very weak solution and a strong imagination will enable one observer to experience the same tingling that a second would experience with a stronger solution and a less active imagination.

The lethal dose method has also not been carefully enough studied to prove its reliability, so an intelligent discussion is not practicable.

So far as I am aware, the only assay method for cannabis indica is that proposed by Dr. Houghton, or some modification of Dr. Houghton's method. In sufficiently large dose, cannabis indica is capable of causing intoxication in a dog, first evidenced by a swaying from side to side when the animal stands. By determining the amount of the drug necessary to cause the first evidence of intoxication, it is claimed that fairly accurate results can be secured.

The personal equation of the observer is again a factor to be reckoned with. What constitutes the first symptoms of intoxication? One may select the slightest swaying, in which event a normal dog may often deceive him; another observer may demand very marked evidences, for which a much larger dose is required. Moreover, the reaction of the dogs is apt to vary, from the fact that minimal exciting doses are given, these small doses being more apt to bring out individual pecularities than are large ones. It is also true that accurate standardization of cannabis indica is not as essential as it is in the case with some other drugs, owing to the low toxicity of cannabis and the number of efficient substitutes that we have.

In ergot we have a drug of great value and one of such complex character that the chemical assay will probably never be satisfactory. Keller's method was formerly believed accurate, but the consensus of opinion seems that the results secured by the determination of the "cornutin" are not to be relied upon. The method proposed recently by Dr. Wood has also been found wanting, and we are forced to turn to physiological tests.

All of the methods now commonly used for the physiological assay of ergot are based upon attempts to measure directly the therapeutic action of the drug as shown by its effect upon the function of the lower animals or upon their excised organs. The cock's-comb method, which owes its prominence to Dr. Houghton, depends upon the power of most fresh ergot preparations to cause, when administered to a chicken, changes in the comb which may be so pronounced as to result in gangrene. It was formerly believed that this effect upon the comb was due to the vaso-constrictor action of ergot, but this view has recently been questioned. If, as Ellinger claims, identical changes can be produced by cantharidin, it is evident that the action can not be considered characteristic of ergot, and the method can be thought reliable only when it has been shown by careful clinical tests that this gangrene-producing power of ergot as measured on the chicken runs parallel with the therapeutic activity of the drug. The work of Edmunds and Hale, showing the agreement between the cock's comb test and the test upon the uterus of one of the lower animals is very suggestive.

The cock's comb test has been adversely criticized, but it would seem that in

some instances the poor results were due not so much to weakness of the method as to faulty technic. In our laboratory we aim to use fowls of the same breed and of as near the same age and weight as is practicable. The drug, in the form of a fluidextract, is injected into the pectoral muscles or into one of the wing veins. If the fowls are picked up at random and not kept under precisely similar conditions, accuracy can not be hoped for. It has seemed to us, also, that the oral administration of ergot to chickens is objectionable, because certain of the active constituents are not supposed to be absorbed from the gastro-intestinal canal.

It is certainly true that the reaction not being automatically recorded is a serious disadvantage. Here, as in some of the other tests I have mentioned, the individual bias of the observer is apt to interfere with accuracy, and the results secured by different men may differ widely owing to the different degrees of reaction aimed at.

Some years ago, Dixon proposed that the vaso-constrictor action of ergot, as evidenced by the rise in the blood pressure of a mammal, be made use of in the attempt to standardize ergot preparation. This method has been extensively used in England, but seems to have at least two serious disadvantages. In the first place, it has been shown (Goodall, Dale, Edmunds and Hale) that the effect upon the blood pressure and upon the uterus *are not always parallel.* So far as I can learn, there is no experimental evidence for supposing that the two sets of effects (upon the blood pressure and upon the uterus) are part of a widespread general action of the drug, and the assumption that vaso-constrictor action is an index of the potency of uterine action is not justified. Dale and Laidlaw have pointed out that B-iminazolylethylamine, one of the constituents of ergot, causes tetanic uterine contraction with a coincident fall in blood pressure.

Even were this method to represent a measure of the therapeutic value of ergot, it does not seem practicable to secure an accurate measure by means of it. Unlike adrenalin, ergot, in an amount large enough to produce an appreciable rise of blood pressure, has a very lasting effect and it is not practicable to make more than one injection into the same animal for purpose of comparison. If the same preparation be given to a number of different animals, it is apparent that these different animals will show great differences in the blood-pressure effects.

Finally, there are the two methods in which the effect of ergot upon the uterus itself is observed. In Kehrer's procedure, the organ is excised and the ergot, in solution brought into contact with it. In the method advocated by Dr. Edmunds, the movements of the uterus of a cat are observed by means of opening the abdomen of an anaesthetized animal in salt solution, the drug being injected intravenously.

There are several points which seem to render these methods undesirable. In the first place, both methods are technically rather difficult. Again, it is claimed that the condition of the uterus as regards parturition influences the reaction to ergot. Certain of the active constituents isolated by Barger stimulate the

parturient, but inhibit the virgin uterus. Then spontaneous movements often set up and cease from some unknown cause.

The most important drug on our list is digitalis. The fact that digitalis is so widely used and that variations in strength on either side of a mean is liable to have disastrous consequences renders it extremely desirable to secure some means of standardizing the medicinal preparations of this drug. A discussion of digitalis would also include apocynum, convallaria, strophanthus, and squill, since there is at present no satisfactory chemical assay for any of these.

The lethal dose method for testing digitalis was the first method to be employed commercially in attempting to standardize drugs by pharmacological experiments. To Dr. Houghton belongs the credit for this important step, which he took when he devised his 12-hour frog method for the assay of the heart tonics. This method is based upon the determination of the lethal dose of digitalis for frogs.

Dr. Houghton had also used guinea pigs in standardizing the heart tonics, but found them unsatisfactory. Dr. Reed, however, believed more accurate results could be secured by using guinea pigs rather than frogs.

Dr. Hatcher recently announced his cat method, by which he claimed great accuracy could be obtained, while, at the same time he considers the method to be simple and cheap.

I have already mentioned briefly a possible source of error is testing a drug by lethal dose methods. Does the therapeutic value of digitalis run parallel with its toxicity for lower animals? Is, as has been claimed, this lethal action of digitalis upon a guinea pig or a cat simply an exaggeration of the therapeutic action of the drug, the poisoning of the heart being the cause of death? Dr. Reed, Dr. Githens, Dr. Hatcher, all claim this to be the case. Cushny, on the other hand, states that even the glucosides of therapeutic value act largely upon the central nervous system; while Edmunds and Hale believe that the death of mammals after digitalis poisoning sometimes results from failure of the heart; sometimes from failure of the respiration. Nestor has come to the conclusion that death of rabbits from the lethal action of the glucosides is always due to respiratory failure, and, in some instances, he was able to save animals from the "dose always fatal" by the maintainance of artificial respiration. From a few experiments upon guinea pigs, I have always found the heart beating strongly after complete cessation of respiration and apparent death of the animal. In a series of experiments carried out in our laboratory by Mr. Eckler, using Dr. Hatcher's method, the respiratory movements of the cats were continued after apparent cessation of the heart beat, but the respiration was often seriously embarrassed before any appearances of cardiac failure. When "pure principles" are used, it is probable that the death of frogs results from cardiac poisoning, and, consequently, this method would represent a measure of the therapeutic action of such pure principles.

If we could assume that it was the bodies of therapeutic value alone that caused the death of the animal, it would not be so important how death was caused, provided there was shown to be a constancy in the dosage required. But in the Galenical preparations of digitalis we have very complex mixtures.

Suppose, as Dr. Hale pointed out, there should be a relative excess of digitonin present in a tincture of digitalis. Owing to the lethal action of this glucoside, very misleading results would be obtained by using a lethal dose method, and a preparation not only therapeutically weak, but capable of causing serious harm if used clinically might be considered of good strength.

On theoretical grounds, Dr. Cushny's frog heart method seems to avoid these objectionable features. This is a qualitative test of undoubted value, for I do not know of any substances present in digitalis leaves capable of producing the typical "digitalis heart" except the glucosides of the heart tonic series which are of value therapeutically. Even could we measure accurately the toxicity of digitalis for lower animals, it can not be claimed that we are always sure of measuring the therapeutic activity of the drug, for not only may a relative excess of the undesirable digitonin be present, but it is possible that injuriously acting decomposition products may arise with the aging or manipulation of a preparation, and it is certainly conceivable that as a tincture ages and deteriorates, it may increase in toxicity for mammals and at the same time not only lose in therapeutic efficiency but actually acquire an increasing power to do harm if used clinically. By observing the action on the frog's heart, we gain positive information concerning the desired glucosides, for they alone, so far as I can learn, are capable of bringing about the characteristic changes in the heart. Focek's method also possesses this advantage, but the barbarity it necessitates will prevent its adoption. The perfusion of the isolated heart involves a complicated technic and can not be considered very accurate.

It has been urged that the frogs vary markedly in their reaction to digitalis, but from my limited experience, I can agree with Hale and Focke that the unsatisfactory results secured are rather due to lack of care on the part of the operator than to unfitness of frogs. When we see the concordant results of Famulener and Lyons and Hale we can not but feel that the method of Cushny is accurate. It may be of interest to state that with ouabain, a pure substance, the same results were secured in Dr. Houghton's laboratory and ours, these results being obtained in each place without knowledge of the work in the other laboratory. To eliminate the possibility of variations due to season or locality, a definite chemical compound, such as strophanthin, suggested by Dr. Houghton, or, preferably, ouabain may be used, and the frogs themselves "standardized."

On the other hand, some authorities would have us think that mammals do not show appreciable individual variation. In the hands of Dr. Hatcher, remarkably uniform results were secured in the early work with his cat method, but he has recently reported an error of 50%+.

I have been unable to find the report of any very satisfactory evidence showing that guinea pigs react uniformly to digitalis regardless of age, weight, sex, season and diet. It would seem advisable to publish such evidence in view of the marked variation sometimes shown by guinea pigs in their resistance to bacterial poisons and the interesting experiments by Dr. Hunt, showing the effect of different diets on the resistance of guinea pigs to poisoning by acetonitrile.

Dr. Houghton has, I believe, found his method involves an error less than

10%. Using "pure principles" Hale has found the one hour method fully as accurate as this. In our own laboratory we have made our work, carried out independently, check within 10%.

There can be no question as to the economy of the different methods. Frogs for an assay cost us about 50 cents. Guinea pigs would cost us about $4.00. Cats could not be secured in Indianapolis in sufficient numbers for our use.

As regards simplicity, there is little to choose between Houghton's and Cushny's method. The guinea pig can not be handled by one man; while Hatcher's method is quite complicated.

The one hour frog method enables us to complete an assay in, at most, three hours. Houghton's method requires at least 24 hours, as does the guinea pig method. The actual time needed to run one cat, according to Hatcher's method, is 90 minutes. If, as seems necessary, three animals are used, the whole day is taken up, the preparation of the animals requiring some time.

Accuracy, cheapness, simplicity, speed. It would seem that in none of these points is Cushny's method excelled. Houghton's method is more time consuming, and it is conceivable that it may give erroneous results when other poisons besides the active glucosides are present in large amount.

It seems that the frog heart method is the only one that has been controlled clinically. Pratt, in this country, has shown how the therapeutic efficiency of digitalis leaves varied as did their strength as determined by this method. Focke, also, mentions similar comparisons. The worth of digipuratum, which is standardized by a modification of Cushny's method, has been shown by many clinical tests.

In conclusion, it may be said that in the one hour frog heart method is offered a means of standardizing digitalis which compares favorably with chemical assay methods when the test is carried out with due precautions by trained men.

It would probably be unwise to adopt as official any of the methods now used for the pharmacological assay of aconite, cannabis indica, or ergot. Further study is needed before it can be determined which are most suitable, but in the meantime it is very desirable that manufacturers use these methods, thereby insuring more nearly uniform preparations and also acquiring valuable data upon the methods used.

ELI LILLY & CO. PHARMACOLOGICAL LABORATORY, July 9, 1911.

VARIATION IN THE SUSCEPTIBILITY OF THE GUINEA PIG TO THE HEART TONIC GROUP.

CHAS. E. VANDERKLEED.

Pharmacologists are divided in their opinion as to the best method for determining the strength of preparations of the digitalis series by biologic means. Many papers have appeared during the last few years advocating the use of this or of that method, but a careful review of the literature shows that, in the opinion of

the majority of the workers, the question narrows down to a choice between one of the frog methods and the guinea pig method of Reed and Vanderkleed. Hatcher's proposed cat method has apparently gained no additional supporters, undoubtedly because of the complexity of its technique.

It is not the purpose of this short communication to discuss all of the many phases and problems of biologic standardization. Attention is called, however, to the fact that the frog method and the guinea pig method are both toxic or lethal does methods, and hence, to this extent at least, are amenable to comparison. The question of the effect of the heart tonic drugs on the respiration, in the case of guinea pigs, has been offered as one of the objections to the employment of these animals for the biologic assay of these drugs. This problem has been the subject of an extensive series of experiments during the past summer by Dr. L. T. De M. Sajous, consulting pharmacologist of the H. K. Mulford Company, who will report on this subject during the course of the next few months. He has authorized me to say, however, that in the course of his work, by means of artificial respiration, he was able at most only to prolong the life of a guinea pig to which had been administered a minimum lethal dose of tincture of digitalis for from 30 to 40 minutes. Such being the case, he believes that the effects of digitalis on the respiration in the case of guinea pigs does not materially affect the results obtained by the lethal dose method.

The most important contrast between frogs and guinea pigs as test animals lies in the claim by advocates of the latter that the susceptibility of the guinea pig, unlike that of the frog, does not vary or does not vary so greatly with climate, temperature, food, season, weight and sex. That frogs do so vary is admitted by the advocates for their employment, as shown by the suggestion by Houghton that crystallized strophanthin be employed as a standard for checking the susceptibility of each lot of frogs employed in the standardization of a preparation of unknown strength. (See also Hygienic Laboratory Bulletins Nos. 48 and 74, by Edmunds and Hale.) On the other hand, Haskell[1] has recently claimed that the advocates of the guinea pig method have only half-heartedly claimed that guinea pigs do not show the same variations. Thus he quotes Reed as saying that the guinea pig "does not *appear* to offer so wide a variation"; Githins as saying that the guinea pig *"shows* no such variation"; and the Philadelphia committee on pharmacologic assay as stating that the susceptibility of guinea pigs to digitalis does not vary under ordinary conditions, *"so far as is known."* The effect of Haskell's quotations is to create the impression that these advocates of the guinea pig as a test animal were not all *convinced* of the superiority of the guinea pig over the frog in this respect, and he goes on to show the possibility of a great variation in the susceptibility of guinea pigs, *to digitalis,* by mentioning an article by Arms[2] entitled "Some Freak Results from Animal Inoculation," in which that author reported on the effects of inoculations of guinea pigs with glanders and with emulsion of nervous tissue from rabid dogs! The irrelevancy of such experiments to the question at issue only

[1]American Journal of Pharmacy, May, 1911, p. 201.
[2]Journal of Public Hygiene, XIX No.3.

seems to indicate an *a priori* prejudice against the employment of the guinea pig. Haskell's further observation that the advocates of the guinea pig method have put forth unusual efforts to discover defects from the unfitness of the frog, seems to be paralleled by his implied unfitness of the former animal.

Taking up the objections to lethal dose methods in general, Haskell further states that "the active glucosides of digitalis may become decomposed into such bodies as digitalresin and toxiresin, which, resembling picrotoxin, have a depressant action on the heart, and a preparation containing a large amount of such decomposition products, while testing high by lethal dose methods, might not only be below standard, but capable of causing dangerous poisoning." In support of this possibility he quotes Edmunds and Hale in their Bulletin No. 48 of the U. S. Public Health and Marine Hospital Service, as follows: "One solution might be very weak in its action upon the heart and yet contain decomposition products of digitalis whose typical action is upon the medulla, and it would, therefore, appear unduly strong when judged by such a standard. For this reason, we think that methods which employ as a standard the minimum lethal dose upon the higher animals are not applicable to the physiological assay of the digitalis series."

In this bulletin, however, these authors offer no evidence to show that such a condition ever obtains; on the contrary, a study of their experiments shows that they observed cases in which preparations containing large amounts of decomposition products and producing but a small or even negative rise in blood pressure, were administered in doses four times as great as the minimum lethal dose of an active preparation without causing any symptoms whatever in guinea pigs, and they observed other cases in which such preparations were injected in doses eleven times as great as the minimum lethal dose of an active preparation without causing death. This objection to lethal dose methods, therefore, does not seem to be sustained, or at least remains to be proved. Moreover, if the minimum lethal dose method be checked by a chemical assay for digitoxin, an additional safeguard against the possibility of wrong interpretation of the physiological results is provided.

Haskell, however, goes on to say, "Doubtless, numerous investigations have been carried out to show that guinea pigs do not vary in their resistance to digitalis intoxication, but I have been unable to find the report of a single series of experiments performed with the object of showing that guinea pigs are not fully as much influenced by adventitious circumstances as are frogs." This, being a perfectly rational and legitimate challenge, I shall endeavor to answer it, first, from a review of records of some hundreds of experiments startel in July, 1911, and so planned as to cover one complete revolution of the seasons. The complete report of this series of experiments can, of course, only be given twelve months hence—but some preliminary data have already been collected and may be of interest here.

Reverting to the records of guinea pig injections above referred to, I would state that the conclusions as guardedly expressed, and properly so as becomes scientific investigators, by Reed, Githens, and the Philadelphia Committee, were based upon the fact that, in the course of hundreds of injections, *apparent*

variations in susceptibility were so few as to be, on the whole, negligible. In these experiments, guinea pigs bred and raised by no less than a dozen different breeders were employed. The pigs, once aggregated from these various sources, were, of course, subjected to approximately the same general conditions, but no unusual means of preserving uniformity were employed. Seasonable food was given them, principally oats and hay, together with greens, such as lettuce, carrot tops, corn stalks, cabbage, etc., in season. The temperature change to which they were subjected was that of Philadelphia, which, as is well known, is a considerable one. In Winter, the general guinea pig quarters are heated to 65 or 70° F., while the rooms into which they are transferred during the time of testing are heated to about 75° F. Thus, no *particular* attention is paid to the question of source, food, or temperature, nor, in the hundreds of injections made in our laboratories, are any selections made as to sex. The weight of the individual animals employed has ranged from 225 to 500 gm.—the dose given being always calculated on the basis of 250 gm. weight. In spite of the lack of attempting to systematize the conditions under which the animals are kept, and tested, the precentage of non-concordant results obtained has been well within 5%. By this is meant that, in finding the minimum lethal dose of any preparation, down to a variation of 10%, and in most cases much less than 10%, a series of pigs, taken at random, and given injections of progressively larger doses, *all* receiving a certain dose or more will die, and *all* receiving a smaller dose will recover. A second smaller series is always injected to check the results of the first series, and, as stated above, not five pigs in one hundred have been found to die with a smaller dose than that found as the m.l.d. in the first series, or to recover when given the same or a larger dose—the doses being increased successively in tenths.

It was upon this evidence that the guarded opinions expressed by Reed, Githens and the Philadelphia Committee were based. In addition to the above variations, another variation not heretofore brought out has been noted. As is well known, the guinea pig is the official test animal employed in the standardization of sera such as diphtheria antitoxin. That its use for this purpose leads to unquestioned uniformity of product is universally acknowledged, and officially sanctioned by the U. S. P. H. and M. H. Service. In the course of standardizing sera, large numbers of pigs survive, but can not be used again for testing sera. The question naturally arose as to whether such pigs could be used for the standardization of the heart tonics. Series of such pigs have been repeatedly used along with previously unused pigs and no change in the susceptibility to digitalis and the other heart tonics noted. It is only essential that they may be in good physical condition and fully recovered from the physical injury inflicted by the prior injections of toxins and antitoxin.

Taking up now the experiments started in July, I would state that the principal advantage of the guinea pig over the frog lies in the claimed non-necessity for employing and keeping on hand a "standard" against which the susceptibility of the animals must be checked. If this advantage can not be sustained, the guinea pig method loses one of its more important claims to superiority, although it possesses some other advantages over the frog which in turn are met with

certain minor disadvantages, such, for example, as that of cost. Confining ourselves, however, to the main question at issue, I will outline the nature of the experiment being conducted, and give a summary of results so far obtained.

The experiment has been undertaken to show what effect, if any, season (and, incidentally, temperature), food, weight and sex has upon the susceptibility of the guinea pig to digitalis intoxication. Recognizing the difficulty and uncertainty of keeping a standard digitalis absolutely unchanged throughout one year (and any whatever would, of course, nullify the value of the experiment), I have adopted as the standard preparation to be employed, crystallized ouabain, which has been selected by the advocates of the frog methods for the purpose of standardizing their test animals.

The experimental pigs have been divided first into two classes, as regards sex—male and female. Each of these classes has been further subdivided into two classes as regards weight—those ranging from 225 to 275 gm., and those ranging from 350 to 500 gm.

Each of these sub-classes was at first further subdivided into two classes as regards food—one class receiving for two weeks prior to the test, nothing but oats—the other class receiving during the same time nothing but greens. It was soon discovered, however, that the pigs receiving nothing but greens easily succumbed to the unusually torrid weather which prevailed in Philadelphia and in many other parts of the country during July. Greens alone appeared to possess an insufficient amount of nourishment to maintain the animals in healthy physical condition—several deaths occurring in the cages.

The differentiation as regards food was, therefore, discontinued, the fact having been proved to us that test pigs must be fed upon grain (oats) as well as upon greens in season, and that the grain is the more important. This fact, however, does not in itself discredit the guinea pig as a test animal, since we are limited very much in any case in the variety of foods which this animal will eat.

A further important observation was made during this exceedingly hot month of July. We discovered that a factor of more importance than temperature on the health of the guinea pigs is ventilation—fresh air. Our main supply of pigs is kept under conditions already described in the country. For the purpose of making these and other tests, the pigs are brought into the city, where the problem of housing and ventilation is a more difficult one. During the July fourth vacation several deaths occurred in the cages, particularly among the pigs fed on greens, and it was found that these were in fact caused by the partial lowering of the windows in their quarters by the attendant during this period, as a precaution against fire from rockets, etc. However, all this only goes to show what all pharmacologists concede, that in any biologic assay whatever, normal, healthy test animals are the first requisite.

The seasonal variations will, of course, be shown by any differences in results noted during the year. Tests are to be made and a new series of pigs in each of the four classes selected for the tests each month.

Thus, at the end of the year, we shall have 12 sets of experiments showing the m.l.d. or resistance to crystallized ouabain, of 4 different kinds of guinea pigs, or 48 tests, covering an entire year's variation in season and, to a certain

extent, temperature. Moreover, if found practicable, we shall have from time to time lots of pigs shipped directly to us from various sections of the country—thus introducing the factor of climate.

Up to the present time, only one set of tests has been made, the results obtained being shown in the following tables. The doses given are in grams per 250 grams body weight:

Small Males, Weighing 140 to 210 gm.

Dose	Weight	Result
0.000040	195	— Recovered
0.000044	200	— Recovered
0.000047	175	— Recovered
0.000050	155	— Recovered
0.000050	210	— Recovered
x 0.0000525	205	+ Died
0.000055	195	+ Died
0.0000575	190	+ Died
0.000060	140	+ Died
0.000069	170	+ Died
0.000072	185	+ Died

M. L. D. = 0.0000525.

Large Males, weighing 270 to 410 gm.

Dose	Weight	Result
0.0000375	285	— Recovered
0.0000400	310	— Recovered
0.0000440	410	— Recovered
0.0000470	320	— Recovered
0.0000470	305	+ Died
0.0000500	270	— Recovered
0.0000500	370	— Recovered
x 0.0000525	315	+ Died
0.0000550	310	+ Died
0.0000600	345	+ Died

M. L. D. = 0.0000525.

Small Females, weighing 160 to 210 gm.

Dose	Weight	Result
0.00004	170	— Recovered
0.000044	210	— Recovered
0.000044	190	— Recovered
0.000047	160	— Recovered
0.000047	170	— Recovered
0.00005	180	— Recovered
0.00005	180	+ Died
x 0.0000525	195	+ Died
0.000055	175	+ Died
0.0000575	180	+ Died
0.00006	160	+ Died

M. L. D. = 0.0000525.

Large Females, weighing 260 to 350 gm.

Dose	Weight	Result
0.0000375	260	— Recovered
0.00004	265	— Recovered
0.00004	335	— Recovered
0.000044	295	— Recovered
0.00044	350	— Recovered
0.000047	260	— Recovered
0.000047	295	+ Died
x 0.00005	350	+ Died
0.00005	285	+ Died
0.0000525	300	+ Died
0.00006	275	+ Died

M. L. D. = 0.0000500.

Thus, it may be seen that male and female pigs ranging in weight from 140 to 410 gm. have shown a minimum lethal dose of about 0.0000525 per 250 gm. body weight, in the first month's tests. Out of 43 pigs in the series only one (the large male which was killed by 0.000047 gm. per 250 gm. body weight, while two other pigs receiving 0.00005 gm. per 250 gm. body weight recovered) died "out of order."

The M. L. D. for small females was considered to be 0.0000525, because, of two pigs receiving 0.00005 gm., one died and one recovered. The M. L. D. for large females was considered to be 0.00005 because, of two pigs receiving 0.000047 gm., one died and one recovered.

The variation in results obtained from month to month will in due season be published, and I trust that they may go far toward establishing the degree of variation in the susceptibility of these little animals to the heart tonic drugs which is to be expected.

As a matter of possible interest, the minimum lethal dose of the ouabain used in the guinea-pig experiments was determined by Houghton's "one-hour" method for three classes of frogs as follows:

MALE LEOPARD FROGS (RANA PIPIENS) FROM ILLINOIS.

Weights ranged from 38.5 to 57.5 gm. Temperature of water in frog tank 26.5 to 29.5° C. Temperature of room 25.5 to 28.5° C. The doses given are in grams per gram body weight.

Dose	Weight	Result
0.000,000,30	42.0	— Beats.
0.000,000,31	40.0	— Occasional Beat.
x 0.000,000,32	45.5	+ Stopped. Extra Contraction on Stimulation.
x 0.000,000,32	55.0	+ Stopped. Extra Contraction on Stimulation.
x 0.000,000,32	56.5	+ Stopped. Extra Contraction on Stimulation.
x 0.000,000,32	57.5	+ Stopped. Extra Contraction on Stimulation.
0.000,000,33	42.5	— Non-absorption.
0.000,000,34	38.4	+ Stopped. No extra Contraction on Stimulation.
0.000,000,34	44.0	+ Stopped. No extra Contraction on Stimulation.
0.000,000,36	45.0	+ Stopped. No extra Contraction on Stimulation.
0.000,000,39	40.0	+ Stopped. No extra Contraction on Stimulation.

M. L D. considered to be 0.000,000,32.

FEMALE LEOPARD FROGS (RANA PIPIENS) FROM ILLINOIS.

Weights ranged from 30 to 62.3 gm. Temperature of water in frog tank 26.5 to 29.5° C. Temperature of room 25.5 to 28.5° C.

Dose	Weight	Result
0.000,000,36	40.0	— Beats.
0.000,000,36	34.0	+ Stopped.
0.000,000,37	34.0	— Slight beat in Auricle.
0.000,000,37	43.5	— Slight beat in Auricle.
0.000,000,37	36.0	— Beats.

0.000,000,38	37.5	— Beats.
0.000,000,38	34.0	— Beats.
x 0.000,000,38	30.0	+ Stopped. Extra Contraction on Stimulation.
x 0.000,000,38	37.5	+ Stopped. Extra Contraction on Stimulation.
x 0.000,000,38	62.3	+ Stopped. No extra Contraction on Stimulation.
0.000,000,39	50.5	— Beats.
0.000,000,39	66.6	— Auricles still Contracting.
0.000,000,39	37.0	+ Stopped. Extra Contraction on Stimulation.
0.000,000,39	46.0	+ Stopped. No extra Contraction on Stimulation.
0.000,000,39	48.0	+ Stopped. No extra Contraction on Stimulation.
0.000,000,40	40.0	+ Stopped. No extra Contraction on Stimulation.

M. L. D. considered to be 0.000,000,38.

FEMALE BULLFROGS (RANA CATESBIANA) FROM PENNSYLVANIA.

Weights ranged from 38.5 to 54 gm. Temperature of water in frog tank 24.5 to 26.5° C. Temperature of room 24 to 25.5° C.

Dose	Weight	Result
0.000,000,36	48.2	— Beats.
0.000,000,40	41.0	— Beats.
0.000,000,45	41.0	— Beats.
0.000,000,47	43.0	— Beats.
0.000,000,50	42.0	— Auricles still Contracting.
0.000,000,51	38.5	— Auricles still Contracting.
x 0.000,000,52	39.6	+ Stopped. Extra Contraction on Stimulation.
x 0.000,000,52	40.0	+ Stopped. Extra Contraction on Stimulation.
x 0.000,000,52	40.5	+ Stopped. Extra Contraction on Stimulation.
x 0.000,000,52	38.5	+ Stopped. Extra Contraction on Stimulation.
x 0.000,000,52	48.5	+ Stopped. Extra Contraction on Stimulation.
0.000,000,53	40.5	— Non-absorption.
0.000,000,53	48.0	+ Stopped. No extra Contraction on Stimulation.
0.000,000,53	54.0	+ Stopped. No extra Contraction on Stimulation.

M. L. D. considered to be 0.000,000,52.

It appears therefore that in the above experiments the minimum lethal dose for the three classes of frogs varied as follows:

Male Frogs (Rana pipiens) from Illinois.....	0.000,000,32
Female Frogs (Rana pipiens) from Illinois.....	0.000,000,38
Female Bull-frogs (Rana catesbiana) from Pennsylvania.....	0.000,000,52

or, the lethal dose for female frogs from Illinois was about 19% greater than for male frogs from the same locality, while the lethal dose for female bull-frogs from Pennsylvania was 62.5% greater.

In conclusion I wish to acknowledge my indebtedness to Dr. P. S. Pittenger and Mr. Leo Glickman for assistance in carrying out the experimental work.

RESEARCH LABORATORY OF THE H. K. MULFORD COMPANY, PHILADELPHIA, PA.

SUSCEPTIBILITY OF THE GUINEA PIG TO POISONING BY DIGITALIS.

A. L. WALTERS, B. S. AND C. C. HASKELL, A. B., M. D.

A method of drug assay to be suitable for an official assay process should be accurate. This point outweighs all others, and many objectionable features can be overlooked if the method in question enables us to measure accurately the therapeutic properties of the drugs examined. Nevertheless, should two methods show no appreciable difference regarding the degree of accuracy attainable, the cheapness, simplicity, and rapidity of performance come to have considerable influence in the choice between them.

The advocates of the frog methods believe that careful investigation, extending over many years in different laboratories has shown that these methods carried out upon "standardized" animals enable the pharmacologist to estimate the strength of digitalis preparations with an error not greater than 10 per cent. So far as we have been able to learn, the valid objections to the use of frogs are removed when a reliable standard, such as ouabain or Houghton's crystalline strophanthin, is used. Compared with the guinea-pig method, proposed by Dr. Reed, the frog methods are much cheaper. In the assay of digitalis preparation by the one-hour frog heart method, we practically never use more than 18 frogs, the cost of which varies from forty to seventy-five cents. Our ignorance of the routine use of the guinea-pig method prevents us from stating definitely the cost of an assay. It scarcely seems probable, however, that, on an average, less than six or eight animals would suffice. The guinea pigs we have been able to obtain have cost us from 40 to 75 cents apiece, making the probable cost of an assay from two to six dollars, about 800 per cent. greater than the frog method.

Closely connected with the cost, are the rapidity and simplicity of execution. By the one-hour frog heart method, an assay can be completed by one man in three hours at the utmost. By the guinea pig method, at least twelve hours must be consumed, and probably twenty-four. Moreover, an assistant is required in injecting the solution into the guinea pig and accuracy of dosage is more difficult to obtain. It would seem, from the investigations that we have carried out, that an alcoholic strength of 25 per cent. has no appreciable influence on the reaction of frogs to ouabain, so that removal of the alcohol from official digitalis preparations is not necessary for their assay upon frogs, since the necessary dilution accomplishes the desired reduction.

But if it be granted that the guinea-pig method is deficient in these points, is the accuracy attainable by it sufficient to counterbalance the less important considerations? Dr. Reed and Dr. Githens are convinced that this is so, and the opinions of such careful investigators is worthy of much consideration.

The question of the lethal action of digitalis upon mammals is of some interest. Dr. Githens believes that guinea pigs die as a result of the action of the drug upon the heart, all the phenomena observed being due to circulatory embarrass-

ment. It would seem advisable to adduce experimental evidence in support of a view which is denied by such men as Edmunds, Hale, Cushny, and, apparently, has been disproven for rabbits by Nestor.

This point, however, is relatively unimportant if it can be proven that the lethal power of digitalis for guinea pigs runs parallel with the theapeutic efficiency of the drug. That such parallelism exists, however, is a dangerous assumption if our knowledge concerning the chemistry of digitalis is correct. It is held that the glucosides tend to break up under certain poorly understood conditions, giving rise, probably, to numerous decomposition products, among which toxiresin and digitalresin are prominent. According to Sollman, these bodies appear to be more poisonous than the oroginal glucosides, so it is conceivable that an old, deteriorated preparation, one that is not only therapeutically weak but capable of doing serious damage if used clinically, would seem of good strength when tested by a lethal dose method. If we are right in the assumption that the therapeutically active glucosides are the only substances present in digitalis preparations which are capable of bringing about the cardiac changes upon which the one-hour frog heart method is based, it is evident that this method, being a qualitative as well as quantitative test of digitalis, possess a great advantage over the lethal dose methods.

Aside from these theoretical considerations, what evidence is there for or against the guinea pig as a test animal? So far as we can discover, there have been no reports of experiments carried out to show that the susceptibility of guinea pigs to digitalis poisoning is constant regardless of age, weight, sex, diet, season, or locality. On the other hand, Dr. Houghton has found them less useful than frogs, and, as the result of his earlier work, he discarded guinea pigs for the latter animal in the assay of strophanthus.

While the variations in the susceptibility of guiena pigs to other poisons cannot be accepted as positive proof that similar variations will occur when digitalis is the toxic agent, yet such evidence is very suggestive.

Dr. Arms has called attention to the fact that very striking individual variations are encountered when tests are made upon guinea pigs with the virus of rabies or with material containing infectious organisms. Hunt has shown that guinea pigs vary in their susceptibility to acetonitrile according to season and diet. In January, the m. l. d. of acetonitrile per gram guinea pig was 0.20; in July, 0.45, a difference of 125 per cent. One series of pigs fed on green food survived a dose of 0.53 gm., while a second series, kept on an oats diet under similar conditions, succumbed to a m. l. d. of 0.23, a difference of 130 per cent.

Sudmersen and Gleny found that guinea pigs varied in their susceptibility to diphtheria toxin according to season and inversely as to age. In January, the approximate m. l. d was 0.006; in July, 0.009; a variation of 50 per cent. It is worth noting that these investigators found that the animals' resisting power to diphtheria toxin was greater in summer and fall, agreeing with Hunt's results when acetonitrile was used.

If similar variations in the susceptibility of guinea pigs to digitalis poisoning should be found present, it is obvious that these animals would be suitable for

the assay of the members of the digitalis group only when a standard preparation is used on a control series of pigs, and the method would possess absolutely no advantage over the frog methods, while being much more cumbersome. In view of these facts, we have taken up the study of the susceptibility of guinea pigs to poisoning by members of the digitalis series in the attempt to learn whether this susceptibility is the same in a series of animals kept under similar conditions is uninfluenced by artificial respiration; by the weight of the animals; by the diet of the animals or by the season of the year. Further, we wish to investigate the action of old preparations of digitalis upon frogs and upon guinea pigs to see whether the rate of deterioration is the same as determined by the two methods.

In this paper we present only a preliminary report. Two factors, the lack of time and the great difficulty of securing guinea pigs, have forced us to postpone much of that we had contemplated doing, but we have secured some rather incomplete data upon a few of the points mentioned.

We found it impossible to obtain a sufficient number of pigs, although we tried dealers in Indianapolis, Terre Haute, Lexington, Chicago, and Boston. The pigs we secured were, except when stated otherwise, fed liberally on oats, hay and cabbage, and had access to water constantly.

In these earlier experiments, we have used the crystalline gratus strophanthin or ouabain of Merck. A stock solution of 1 to 1000 was made up with 70 per cent alcohol, and this was diluted 1-10 with normal salt solution before injection. We realize that there are points of difference in the action of the various members of the digitalis group, but we do not believe that these differences are great enough to vitiate the results we have secured. The solution was injected under the skin of the abdomen by means of the Hitchens syringe, by which accuracy of dosage was secured.

Dr. Reed at first considered that any animal receiving a lethal dose would succumb within three hours. The time was subsequently extended to twelve hours, but the impossibility of working a twelve hour limit in the ordinary day led us to adopt a twenty-four hour limit. One pig succumbed after thirty hours; another after fifty hours had elapsed.

In every instance that we observed the lethal action of tincture of digitalis or of ouabain upon guinea pigs, we noted that the animals made violent ineffectual inspiratory efforts, the phenomena suggesting obstruction of the air passages. In a few minutes the struggles ceased, the animals lost consciousness and were apparently dead, but in every case the heart could be distinctly felt beating, and continued to beat several minutes. On opening the chests of such animals after the heart had ceased beating, the organ was always in diastole. We were convinced from this that the cause of death from poisoning by ouabain was due to respiratory failure, and to prove this we instituted artificial respiration on six animals, commencing to operate only when voluntary respiration had entirely ceased and the pigs were apparently dead. In all but two instances, marked temporary improvement occurred in the condition of the animals, but we were not able to save any of the series. From this we were led to conclude that death

of guinea pigs from poisoning by ouabain is due primarily to respiratory failure, but that cardiac poisoning is concerned in this and would ultimately, in itself, cause death. Possibly, by the earlier institution of artificial respiration, death could be averted, but we did not consider the point of sufficient importance to justify the necessary infliction of pain.

It must be remembered that the different members of the digitalis group differ among themselves as regards the relative intensity of their action upon the central nervous system and upon the heart. Possibly, ouabain has more of the direct cardiac action than have the bodies that Nestor used, which would account for our contradictory results.

The following are records of observations typical of the series, save in the two animals where death occurred before commencement of artificial respiration:

No. 1. 1:15 P. M.—Pig weighing 485 grams received 0.00035gm. ouabain per gram body weight, subcutaneously.
2:50 P. M.—Complete cessation of respiration. Animal limp and apparently dead, except for strong, rapid heart-beat.
2:52 P. M.—Artificial respiration begun.
2:58 P. M.—Animal struggles feebly; heart beat strong and regular.
3:27 P. M.—Thorax opened. Heart contracting feebly; slow and regular rate.
3:45 P. M.—Heart ceases in systole.

No. 2. 1:45 P. M.—Weight 280 gm. received 0.00000025 gm. ouabain per gm. body weight, subcutaneously.
2:30 P. M.—Violent convulsions.
2:35 P. M.—Respiration ceased. Limp and unconscious.
2:38 P. M.—Artificial respiration begun.
2:40 P. M.—Heart beating strongly.
4:00 P. M.—Heart-beat faintly felt.
4:05 P. M.—Chest opened: feeble auricular contractions. Ventricles contracted.

An attempt was made to learn with what degree of accuracy the minimum lethal dose of ouabain could be determined upon a series of pigs kept under the same conditions. The following were the results secured:

TABLE No. I.

Dose per gm.	Survived	Died
0.00020 mgm.	1	0
0.00023 mgm.	1	0
0.00024 mgm.	1	0
0.00025 mgm.	4	0
0.00026 mgm.	1	1
0.00027 mgm.	4	2
0.00028 mgm.	4	3
0.00029 mgm.	4	5
0.00030 mgm.	2	6
0.00031 mgm.	0	1
0.00032 mgm.	1*	0
0.00033 mgm.	0	1
0.00035 mgm.	0	2
0.000375 mgm.	0	1
0.00040 mgm.	0	1

* Died during night over thirty hours after injection.

From this table it appears that 0.00026 mgm. killed one pig, while 0.00032 mgm. failed to kill another within the twenty-four hour limit, a difference of 23 per cent. It must be understood, however, that the pigs in this series differed

in sex, weight, and the locality from which they came. The individual variation was not nearly as large as we had expected to find, and we are inclined to think that even less variation would be encountered when the pigs are of the same age and weight and are grown in the same locality. We regret that the impossibility of getting a sufficient number of animals prevented us from making this series as complete as it should be.

The next point of practical importance was a study of the influence of diet. We were struck by the rapid increase in the weight of those pigs fed liberally, and it occurred to us that this rapid increase in weight might cause increase in susceptibility.

Two lots of six pigs each were selected and placed under the same general conditions. One lot was fed liberally on a mixed oat, clover hay, cabbage, and carrot diet for seven days. The other lot was fed a restricted amount of the same diet for the same length of time. The well-fed pigs gained an average of 21 grams per pig, while those on the restricted diet lost on the average 14 grams per pig. The minimum lethal dose per gram weight for the pigs on a liberal diet was found to be 0.00026 mg., while that for those on the restricted diet was 0.00025 mg.

TABLE No. II.

No.	Sex			Dose in mg.	*Result of liberal mixed diet.*
1.....	M	328	356	0.00024	Survived.
2.....	M	241	280	0.00025	Survived.
3.....	M	678	684	0.00025	Survived.
4.....	M	173	194	0.00026	Died 1 hr. 10 min.
5.....	M	233	253	0.00027	Died 1 hr. 20 min.
6.....	M	305	319	0.00029	Died 1 hr. 30 min.
					Result of restriced mixed diet.
1.....	M	162	159	0.00024	Survived.
2.....	M	291	280	0.00025	Died 1 hr. 50 min.
3.....	M	579	531	0.00025	Died 1 hr. 30 min.
4.....	F	229	239	0.00026	Died 1 hr. 15 min.
5.....	F	261	250	0.00027	Died 1 hr. 15 min.
6.....	M	343	321	0.00029	Died 1 hr. 7 min.

Hunt found variations in diet to influence markedly the susceptibility of guinea pigs to acetonitrile poisoning and suggests that oats diet has some specific action upon the thyroid. It seemed to us that the susceptibility of these animals to digitalis might be similarly influenced, but the impossibility of securing sufficient numbers of pigs and the limited time at our disposal, prevented us from securing really conclusive evidence on this point.

Sixteen sound, healthy pigs, raised by the same breeder, under similar conditions, were divided into two groups of eight. The members of the first group were fed as much oats as they would take and were given a small amount of cabbage once. The members of the second group were fed as much cabbage and carrots as they would take. As may be seen from the table, the whole time of the experiment was fourteen days, and if such results were observed after this limited time on these different diets, more striking differences would be expected when the experiment extends over considerable time. One pig of Group I became sick and was not used; one pig of Group II was discarded because a part of the ouabain solution escaped from the syringe when the injection was being made.

TABLE No. III.

Series I. Oats Diet.

No.	7-25-11 Weight	8-7-11 Weight	8-8-11 Weight	Dose in gms.		
1	140	167	—	0.00000022	Survived.	
2	200	—	200	0.00000022	Survived.	
3	117	—	116	0.00000023	Survived.	(Died 50 hrs. after injection.)
4	174	—	230	0.00000024	Died.	
5	293.5	—	318	0.00000024	Died.	
6	189	179	—	0.00000024	Died.	
7	174	175	—	0.00000026	Died.	

Series II. Cabbage and Carrots.

1	147	152	—	0.00000026	Survived.
2	315	—	295	0.00000026	Survived.
3	175	178	—	0.00000026	Survived.
4	186	177	—	0.00000026	Survived.
5	221	—	213	0.00000026	Survived.
6	216	—	215	0.00000027	Survived.
7	226.5	—	220	0.00000028	Survived.

The results secured by such a limited number of animals are, of course, not absolutely conclusive. None of the pigs of Group II seemed seriously sick, although a dose of 0.00000028 gm. was given one, while pig No. 3 of Group II succumbed to 0.00000023 after 50 hours and doses greater than this were invariably fatal within 24 hours. It is unfortunate that the scarcity of guinea pigs and the lack of time prevented us from going more fully into this question. We hope to do this later.

In conclusion, we may say that the individual variations in the susceptibility of guinea pigs to poisoning by ouabain, as determined in a small series of animals, varies as much as 23 per cent. This may be due to age, weight, or source of the animals.

2. That the life of a guinea pig that has received a lethal dose of ouabain can be prolonged by the employment of artificial respiration, but in no instance were we able to save the animal.

3. That a diet of oats with a minimum amount of food seems to cause a decided increase in the susceptibility of guinea pigs; while a diet exclusively of green food seems to diminish susceptibility.

The first and third points are of great practical importance, and, if they be confirmed, would seem to render the guinea pig method as now employed unsuited for standardization of the members of the digitalis group.

PHARMACOLOGICAL LABORATORY, ELI LILLY & CO., July 11, 1911.

THE CRIMES OF RESPECTABILITY.

"Theft and murder are awful crimes, yet in any single year the aggregate sorrow, pain and suffering they cause in a nation is microscopic when compared with the sorrows that come from the crimes of the tongue. Place in one of the scale-pans of Justice the evils resulting from the acts of criminals, and in the other the grief and tears and suffering resulting from the crimes of respectability, and you will start back in amazement as you see the scale you thought the heavier shoot high in air."—*William George Jordan.*

EXPERIMENTS WITH THE CAT METHOD FOR TESTING DIGITALIS AND ITS ALLIES.

C. R. ECKLER.

There are at present four American methods in use for the physiological testing of the digitalis series, namely: The twelve-hour frog method, proposed by Houghton; the one-hour frog heart method, proposed by Famulener and Lyons; the guinea pig method, proposed by Reed and Vanderkleed, and the cat method, proposed by Hatcher and Brody.

In view of the large amount of work which is being carried out just now with these methods, with the hope that some one may be found sufficiently accurate and convenient to justify its insertion into the next Pharmacopœia, it seemed proper to report some results obtained with one of these—the cat method of Hatcher and Brody. They describe their method in the *American Journal of Pharmacy* for August, 1910, and state that it is an accurate one, and one that can be conveniently carried out by the retail pharmacist. The purpose of this study was to ascertain with what ease the method could be used, and what uniformity of results could be obtained. Since they have not given all the details of manipulation, I will describe the method as I used it, my endeavor being to carry it out in all respects just as they did.

Fully grown, apparently healthy cats were selected. In general these were stray cats of the city, and represented all common breeds and mixtures. They were accurately weighed, and then anaesthetized in the following manner: The animal was placed in a small box, just large enough to accommodate the body, with a small circular notch at the top of one end of a size which would just admit the neck. A cat in the box with the neck in place, the sliding lid was forced shut and held by a peg. Thus the animal was unable to withdraw its head. The anaesthetic was then given from a small copper cone carrying on a transverse screen a pad of cotton or gauze. A few drops of chloroform were placed on the cotton at the start in order to hasten this operation. As soon as the animal was unconscious this pad of cotton was replaced by another upon which only ether was dropped. The cat was then tied on an animal board (somewhat resembling the Harvard) with back down, legs outstretched, and head securely fastened in a holder. This board, supported on legs, was made so as to drain at a point near the lower (tail) end, under which a receiving vessel was placed. The animal in place, the femoral veins were dissected out and small glass cannulae inserted. The solutions were contained in burettes, the ouabain in one and the digitalis body in the other, and were conveyed to the cannulae by narrow catheter tubing. The injection extended, as near as could be arranged, over a period of ninety minutes.

THE OUABAIN SOLUTION.

Merck's crystalline ouabain was used. The weighing was done on an accurate chemical balance, and a stock solution 1:10,000 was made in a one-litre volumetric flask. For use, samples were drawn off with a pipette and diluted to the strength

1:100,000 in a narrow glass-stoppered 200 cc. cylinder. All dilutions were made with recently prepared physiological salt solution (0.75% NaCl). The stock solution was kept in a cool, dark cupboard, and in no case was used after two weeks old. The solution for use was made up as needed.

After running two preliminary experiments to become acquainted with the technique, a series of twenty-six experiments with ouabain was begun. The procedure and results were as follows:

The weight of the animal having been taken, the theoretical amount of solution required was calculated. Since the lethal dose of ouabain for cats, according to Dr. Hatcher, is .0001 gram per kilogram of body weight, the theoretical amount of solution would be the number of cubic centimeters required, for any given animal, to supply .0001 gm. per kgm. And since each cubic centimeter of a 1:100,000 solution would contain .00001 gm. a 3.2 kgm. cat, for example, would require 32 cc. Ninety minutes being the period of injection, the proportionate part of the theoretical amount necessary to be run in each minute or two minutes, was calculated. The operator seated at the table, continued the anaesthesia by placing a small pad of gauze over the nose and supplying only sufficient ether to just keep the animal quiet. The burette having been filled and the time noted, the injection was begun, running in slowly every minute or two minutes the amount proportioned. The cat was carefully watched particularly toward the end when the larger part of the theoretical amount had been injected. Death was usually preceded by very rapid respiration and decided convulsive movements after which the respiration ceased to be regular and was prolonged for a few minutes only by gasps. As soon as these symptoms of approaching death appeared, the injection was stopped. If, after waiting a few minutes, the animal did not die, the injection was continued very slowly and with great caution. When the respiration had ceased to be regular, the number of cubic centimeters of solution used and the time were noted, and before the gasping had entirely ceased the heart was exposed. In the majority of cases, rhythmic contractions of the heart had ceased. Sometimes the heart was in feeble delirum, but usually the left ventricle was still and the other chambers were feebly contracting. Out of twenty-six experiments with ouabain, sixteen with strophanthus, and twenty-seven with digitalis, only seven hearts were found beating rythmically, and in these the contractions were very feeble. Twelve hearts showed the left ventricle in quite complete systole. It should be remembered that regular respiration had ceased from one to three minutes previous to the exposure of these hearts. In one instance under ouabain, paraldehyde was used as the anaesthetic (1.8 cc. per kgm. Merck's).

Immediately upon appearance of the gasping, without opening the thorax, artificial respiration was instituted. The heart seemed to improve, and continued to beat until at the end of ten minutes one cubic centimeter more of the solution was slowly injected, when it stopped. With cat No. 26, artificial respiration was supplied all through the experiment, still the animal died within the ninety minutes, having received almost the exact theoretical amount. To accurately determine the effect of artificial respiration upon the lethal dose would, of course,

require a large number of experiments, an interesting point, but one I have not been able to work out for lack of time and animals.

OUABAIN.

Date	Cat. No.	Sex	Wt. in kgs.	Cc. of Sol.	Ouabain in gms. per kgm.	Time in Min.
12-16-10	1	Male	2.10	25.0	.000,119	99
12-18-10	2	Male	4.70	32.0	.000,068	70
12-21-10	3	Male	2.80	25.0	.000,089	71
12-22-10	4*	Male	2.00	15.0	.000,075	75
12-24-10	5	Female	1.10	11.5	.000,104	118
12-24-10	6	Male	1.80	16.8	.000,093	87
1- 4-11	7	Male	1.70	16.0	.000,094	93
1- 5-11	8	Male	2.70	16.0	.000,060	61
1-30-11	9	Female	1.19	11.2	.000,094	88
1-31-11	10	Male	2.11	22.1	.000,105	94
2- 1-11	11	Female	1.77	17.4	.000,098	95
2- 2-11	12	Female	2.33	19.6	.000,084	82
2- 2-11	13	Female	0.97	13.0	.000,134	104
2- 3-11	14	Female	2.13	27.0	.000,126	106
2- 4-11	15	Male	3.42	46.0	.000,134	106
2- 4-11	16	Female	2.43	26.5	.000,109	97
2-10-11	17	Male	2.50	23.0	.000,092	82
2-11-11	18	Male	3.27	32.7	.000,100	91
2-13-11	19	Male	2.94	25.5	.000,086	77
2-13-11	20	Male	1.81	17.5	.000,096	86
2-14-11	21	Male	2.40	20.0	.000,083	76
2-14-11	22	Female	1.87	16.0	.000,085	83
2-15-11	23	Male	2.28	22.0	.000,096	90
2-15-11	24	Female	2.25	21.0	.000,093	87
2-15-11	25	Female	1.92	13.5	.000,070	65
6-14-11	26	Female	2.38	24.0	.000,100	87

* Received paraldehyde instead of ether.

Two samples of strophanthus seed (Kombe) were received for testing at this time. These were reduced to No. 60 powder. Ten gm. samples were placed in 150 cc. Erlenmeyer flasks, supplied with good, tightly-fitting corks, and macerated with 40 cc. of 75 per cent. alcohol for 72 hours with occasional agitation. The content of each flask was then poured into a small, narrow percolator fitted at the neck with a tight plug of cotton. The first portion of each percolate was returned and the percolation was then allowed to proceed at the rate of ten drops per minute. Seventy-five per cent. alcohol was added from time to time until 200 cc. of percolate were obtained, thus finishing a 5 per cent. tincture. For injection, 1:6000 solutions were used. These were made in the same manner as described under ouabain. The results from eight experiments on each of these samples were as follows:

STROPHANTHUS SEED No. B-565.

Dilution 1:6000. 1 cc.=.000,166 gm. drug.

Date	Cat No.	Sex	Wt. in kgm.	Cc. Sol.	Strophanthus in gm.	Time
2-16-11	1	Male	2.23	16.0	.001,19	69
2-16-11	2	Male	2.65	22.0	.001,37	100
2-16-11	3	Female	2.82	26.0	.001,53	98
2-17-11	4	Male	2.29	22.9	.001,66	107
2-17-11	5	Male	2.11	24.0	.001,88	100
2-18-11	6	Male	2.98	30.0	.001,66	95
2-18-11	7	Male	3.07	31.0	.001,67	100
2-18-11	8	Female	2.04	18.0	.001,46	66

STROPHANTHUS SEED No. B-566.

2-21-11	1	Male	2.45	26.4	.001,78	102
2-21-11	2	Male	3.17	23.0	.001,20	60
2-21-11	3	Male	1.29	11.1	.001,42	71
2-22-11	4	Male	3.00	24.0	.001,32	60
2-22-11	5	Male	3.17	25.5	.001,33	87
2-22-11	6	Female	3.14	23.5	.001,23	87
2-23-11	7	Male	3.82	29.0	.001,24	95
2-23-11	8	Male	2.93	25.0	.001,41	111

Hatcher and Brody have found after many experiments that if digitalis and the other members of the series are injected, like ouabain and strophanthus, until the animal dies, the results will usually be too high—necessitating a correction of about 20 per cent. They have, therefore, devised a modification of the method which gives results comparable in accuracy, they believe, to those obtained with crystalline ouabain itself. This modification is as follows:

A measured quantity of the digitalis solution (I understand about 5 per cent. of the required amount) is injected during the first period of about ten minutes. After an interval of about twenty minutes the injection is continued, substituting ouabain solution for the digitalis, until the animal dies. The difference between the amount of ouabain actually used to complete the experiment, and the theoretical amount necessary to kill the animal in the absence of the digitalis body, represents the amount of ouabain to which the digitalis body is equivalent. The amount of digitalis body equivalent to .0001 gm., or one "cat unit," is then calculated.

EXAMPLE TO SHOW METHOD OF CALCULATION.

Digitalis solution=1:100 1 cc.=.010 gm.
Ouabain solution=1:100,000 1 cc.=.000.01 gm.

Cat weighing 3.21 kgms. received
- 30.2 cc. digitalis sol. (.302 gm. drug)
- or, .0940 gm. drug per kgm. body weight.
- 5.5 cc. ouabain sol. (.000,055 gm. ouabain)
- or, .000,017 gm. ouabain per kgm. of cat.

The difference between .000,017 gm. the amount of ouabain (per kgm.) actually used to complete the experiment and .000,100 gm. the theoretical amount, or one "cat unit," which would have been required in the absence of the digitalis body, is .000,083 gm.

.094 gm. of the digitalis is therefore equivalent to .000,083 gm. ouabain, or .094 gm. of the digitalis=83% of one "cat unit."

.113 gm. of the digitalis would then be equivalent to one "cat unit."

F. E. DIGITALIS No. 405467.
Digitalis Dilution 1:100.
Ouabain Dilution 1:100,000.

Date	Cat No.	Sex	Wt. in kgms.	Cc. Dig. Sol.	Cc. Ouab. Sol.	Equiv in gm. of 1 Cat Unit	Time in Min.
2-27-11	1	Female	3.21	30.2	5.5	.113,5	95
2-27-11	2	Male	2.88	25.0	3.0	.096,8	61
2-27-11	3	Male	2.87	25.0	7.0	.115,2	100

F. E. DIGITALIS No. 416233.

5- 8-11	1	Male	2.33	14.0	5.2	.077,3	66
5- 8-11	2	Female	2.18	12.0	3.6	.065,8	65
5- 9-11	3	Male	2.07	11.0	4.6	.068,2	80
5- 9-11	4	Female	1.83	10.0	6.7	.086,1	73
5-10-11	5	Male	2.21	11.1	6.0	.068,8	97
5-10-11	6	Male	2.40	14.0	8.0	.087,4	82

F. E. DIGITALIS No. 335929.

5-11-11	1	Female	1.72	10.0	3.5	.072,8	79
5-11-11	2	Male	3.18	15.0	21.0	.138,7	114
5-11-11	3	Female	1.75	11.7	9.0	.137,5	100
5-12-11	4	Female	1.89	10.0	10.0	.112,3	90
5-13-11	5	Female[1]	2.15	10.0	15.0	.153,4	155
5-15-11	6	Female[1]	2.55	12.0	25.5	.522,7	114
5-15-11	7	Female[1]	1.82	12.0	12.0	.193,5	80
5-16-11	8	Male	3.00	16.0	17.5	.127,9	115
5-17-11	9	Female[1]	2.90	17.5	9.7	.090,6	75
5-18-11	10	Male	2.46	16.0	7.0	.090,8	75
5-18-11	11	Female	1.98	11.0	8.0	.093,2	85

[1]In varying stages of lactation.

TR. DIGITALIS No. 2-B.

5-22-11	1	Female	2.11	13.0	3.5	.073,2	61
5-23-11	2	Male	2.89	14.0	16.5	.112,6	95
5-23-11	3	Female[1]	2.35	13.0	15.0	.154,2	85
5-24-11	4	Male	2.83	17.0	3.0	.067,1	111
5-24-11	5	Female[2]	2.46	15.0	14.0	.141,4	106
5-24-11	6	Male	2.30	16.4	8.0	.109,3	81
5-25-11	7	Female	3.00	16.0	7.5	.071,1	73

[1]Lactating.

[2]Apparently in period immediately following lactation. Glands were still enlarged, but not functionating.

ASSAYS ON FOREGOING PREPARATIONS BY OTHER METHODS.

One hour frog heart method. Variety Rana pipiens. Temperature 20° C.

Strophanthus Seed B-565.

Weight in grams.	Dose per gram.	Result
36.5	.000,006,0	Stopped
40.8	.000,005,0	"
15.1	.000,005,0	"
28.1	.000,004,0	"
39.6	.000,004,0	"
23.0	.000,004,0	"
43.8	.000,003,5	"
36.4	.000,003,5	"
48.7	.000,003,5	Beating
35.2	.000,003,0	"
19.4	.000,003,0	"

Strophanthus Seed B-566.

18.2	.000,006,0	Stopped
20.6	.000,005,0	"
23.6	.000,005,0	"
15.4	.000,005,0	"
43.7	.000,005,0	"
18.1	.000,004,0	"
18.5	.000,004,0	"
25.8	.000,004,0	"
28.0	.000,004,0	Beating
28.8	.000,004,0	Stopped
34.4	.000,004,0	"
37.2	.000,003,5	"
45.3	.000,003,5	Beating
49.0	.000,003,5	"
37.6	.000,003,0	"

GUINEA PIG METHOD.

F. E. Digitalis No. 416233.

Weight in grams.	Dose per gram.	Result
709	.000,5	Recovered
786	.000,5	"
825	.000,5	"
467	.000,5	Died
524	.000,5	"
694	.000,6	Recovered
701	.000,6	"
814	.000,6	Died
835	.000,6	"
744	.000,7	"
517	.000,7	"
481	.000,8	"

F. E. Digitalis No. 335929.

750	.000,4	Recovered
340	.000,4	"
736	.000,4	"
680	.000,4	"
815	.000,5	"
630	.000,5	"
737	.000,6	"
772	.000,6	"
737	.000,7	Died
725	.000,7	"
531	.000,7	"
552	.000,7	Recovered
731	.000,8	"
538	.000,8	Died
375	.000,8	"

ONE HOUR FROG HEART METHOD.

Variety Rana pipiens. Temperature 20° C.

F. E. Digitalis No. 416233.

Weight in grams.	Dose per gram.	Result
40.9	.000,50	Beating
42.9	.000,60	"
39.1	.000,60	"
34.0	.000,70	"
46.5	.000,70	"
42.2	.000,75	"
50.8	.000,80	"
38.8	.000,80	"
31.2	.000,90	"
38.2	.000,90	Stopped
31.4	.001,00	"
35.5	.001,00	"

F. E. Digitalis No. 335929.

28.9	.000,90	Stopped
22.0	.000,90	"
21.0	.000,70	"
27.6	.000,70	"
30.5	.000,70	"
23.0	.000,70	"
42.9	.000,70	"
19.3	.000,65	Beating
20.2	.000,60	Stopped
23.5	.000,60	"
36.5	.000,60	"
37.4	.000,60	Beating
36.5	.000,50	"

The assays of these preparations by other methods have been inserted here, with the belief that they will be of some interest to the reader if closely analyzed,

although no decided conclusions can be drawn from so small a number. Considering F. E. Digitalis No. 416233 and No. 335929 by the guinea pig and frog heart methods, it will be seen that while they show almost the same result on the guinea pig, there is a decided difference on the frog's heart. A lack of relationship in the results obtained by these two methods has been observed by others. Remembering that these fluids test the same on the guinea pig, consider the assays by the cat method where No. 416233 is decidedly more active than No. 335929, the reverse of what was found by the frog heart method.

Attention should be called to the lot of animals used for No. 335929, which was perhaps the least suitable of any. It may be noticed that the greater number were females, varying considerably in size, some being in different stages of lactation. (No. 6 was in the early stage and had exceptionally large glands). The males were all large, and the results, perhaps a coincidence, varied somewhat in relation to the weight:

No. 2	Weight.....	3.18	kgms.	Result.....	.140,3
No. 8	"	3.00	"	"	.127,8
No. 10	"	2.46	"	"	.090,8

The assays on the two samples of strophanthus seed are almost identical by the frog heart method, and show but a small difference by the cat method.

Animals. Hatcher and Brody selected cats in preference to dogs, and I believe rabbits, for several reasons, namely: "Accuracy afforded, facility with which they may be obtained, ease with which they may be handled, * * *, cheapness, and the fact that their use does not affect the sensibilities of the sentimental portion of the community to the same extent that the employment of the dog does." Having used no other animals for this particular method, I cannot remark on the point of accuracy. My experience has been that there is little in their favor regarding cost, all things considered. Cats are easily handled, though to my mind are no more so than dogs, or rabbits, except that in the latter greater care is necessary in regard to any dissection or the giving of anaesthetics. I have found them far more difficult to obtain than rabbits and hardly less so than dogs. Whether their use affects the sensibilities of the sentimental portion of the community less than that of the dog, seems questionable. At any rate, the use of cats certainly does affect the sensibilities of many people, and the procuring of a sufficient number of animals for this piece of work has been the source of considerable trouble. And for a manufacturing plant of this size, to secure enough cats to carry out the routine assays on the several members of the digitalis series, would be a practical impossibility. If some easily procurable animal, such as the rabbit, could be used for this work, then one great difficulty would be removed. This point is of immense importance to the manufacturer, by whom nearly all of the practical physiological assaying will always be done.

Having experienced difficulty in buying cats, an attempt was made at this laboratory to raise them, but this met with poor success. It has seemed that only under the very best conditions can cats be kept well for any considerable length of time. It has been our not infrequent experience that cats will refuse sweet milk and raw beef for some time after having been received, and while an abundance of food has been supplied, our cats have usually lost in weight.

Lactating animals cannot be depended upon, as they seem to possess a greater tolerance for the drug, the degree depending on the stage of lactation.

The period and rate of injection. The lethal dose of any of the digitalis bodies cannot, of course, be told at the outset. This is indeed the figure sought. Therefore, "50 per cent. of the lethal dose" is a quantity which can only be widely approximated by one's experience with the given preparation. Whether this point in itself is a matter of great importance, within certain wide limits, I am unable to say. It would seem to be of importance, however, that the injection of all of these drugs be proportioned as evenly as possible over the ninety minutes. After one has injected an amount of digitalis, for example, and has waited the twenty minutes, he is ready to proceed with the ouabain solution. Since he does not know the value of the digitalis, he does not know, consequently, how much ouabain solution it will be necessary to inject during the following period of one hour. And not knowing this point, he is unable to judge how rapidly to inject. If he calcurates on 5 cc. when 10 cc. would actually be required, then he will come to the end of the ninety minute period with the animal still alive, and he must cautiously proceed with the probable result that one hundred and five minutes or so will be covered in completing the experiment. And having injected at a slower rate, possibly a larger amount of ouabain may have been required. On the other hand, if he calculates on 10 cc. when only 5 cc. are necessary, he may kill the animal before the end of the period—perhaps in seventy-five minutes. And having injected at a more rapid rate, possibly less ouabain may have been used than would have been under normal conditions.

It might be remarked that the first experiment would furnish these points. This might be true; still, it might happen that the results from number one would be exceptional. Then the operator would be thrown off on number two, and when he found the results from number two quite different, number three would be necessary in order to tell which was more nearly correct.

If these points are of no importance, then it would seem that the time limit of ninety minutes would be of no importance.

Number of animals and time. In general it would seem that at least three experiments would be necessary in order to determine with confidence the strength of a preparation. If two out of three results checked quite closely, as under F. E. Digitalis No. 405467 (.113,5—.115,2), that number might be sufficient. Under strophanthus seed No. B-565, however, the results show a gradual increase up to the sixth experiment (.001,19; .001,37; .001,53; .001,66; .001,88), and under F. E. Digitalis No. 416233, results Nos. 1, 4 and 6 check each other rather closely (.077,3; .086,1; .087.4), and Nos. 2, 3 and 5 at a different figure check each other even more closely (.065,8; .068,2; .068,8).

If three or four experiments were sufficient, then an assay could be made in one day, a point in favor of the method. This would require one person's entire time and attention for the four and a half or six hours, besides part of the time of an assistant. At that, more actual time would be required than for any of the other methods.

Ease of manipulation and accuracy. The method seems simple, and still, all points considered, it is the most difficult of all with which I am acquainted.

My results have been quite disappointing. They show variations for the different preparations, as follows:

Ouabain	123.3%
Excluding results No. 2, 4, 8, and 25	61.4%
Strophanthus Seed No. B-565	57.9%
Strophanthus Seed No. B-566	48.3%
F. E. Digitalis No. 405467	19.0%
F. E. Digitalis No. 416233	32.8%
F. E. Digitalis No. 335929 (excluding lactating animals)	90.5%
Excluding lacating animals and No. 1	53.0%
Tr. Digitalis No. 2-B (excluding Nos. 3 and 5)	67.8%

My results with crystalline ouabain would indicate that the lethal dose of this substance varies considerably with different animals. It seems, then, irrational to estimate the value of a preparation of digitalis, from its supposed equivalent of a body which is in itself, for any given animal, an unknown quantity. The authors of this method claim that crystalline ouabain will exactly replace digitalis in regard to its toxicity on the cat. It seems to me, however, that there might be some variance in its power to exactly replace different samples of digitalis, depending on the proportion of active principles present and the condition of these principles, whether or not decomposed. Since the amount of digitalis to be injected which will represent 50.75 per cent. of the required amount, is an unknown quantity, it necessarily follows that the amount of ouabain required to complete the experiment, even if its toxicity could be exactly known, is an unknown quantity. Therefore, not knowing the amount of ouabain required, the rate of injection, which probably plays an important part, cannot be known. Lastly, the time required to kill, being dependent on the rate of injection, constitutes another unknown factor. So, when testing a sample of digitalis, one has to deal with six or more unknown factors. This requires an operator of considerable experience and skill.

SUMMARY.

Considering the results of this work, together with my experience with the other methods, I am lead to make the following statements in conclusion:

The cat method of Hatcher and Brody is unquestionably the most complicated and difficult of all the American methods, requiring an operator of considerable experience in animal experimentation.

It is *not* a method that will be found convenient and generally serviceable by the retail pharmacist.

It is more time-consuming than the other methods, requiring constant attention when started.

The item of expense, like that of the guinea pig method, is decidedly in its disfavor.

The procuring of a sufficient number of *suitable* animals is a practical impos-

sibility for the manufacturing pharmacist having a large number of preparations to test. This may also be the source of much unpleasantness and trouble.

Lactating animals cannot be depended upon, as they seem to possess a greater tolerance for the drug, the degree depending on the stage of lactation.

While the individual results will not infrequently check each other very closely, considering the results of an entire assay, great variations will often be observed, amounting in some cases to more than 100 per cent.

When testing a preparation one has to consider six or more unknown factors, namely:

1. Toxicity of ouabain.
2. Power of ouabain to exactly replace the digitalis bodies.
3. Amount of digitalis to be injected.
4. Amount of ouabain to be injected.
5. Rate of injection.
6. Time.

This method has perhaps one point of superiority over all others in that the matter of absorption is entirely eliminated.

LABORATORY OF PHARMACOLOGY, ELI LILLY & CO., Indianapolis, Ind.

THE DRUGGIST AND THE LOCAL ORGANIZATION.

While times among retail pharmacists have improved when we compare them with the past, we believe that the progress is by no means completed. The few years of experience in organization work which pharmacists have had is only a beginning. The future must continue to bring improvement. The time will come when no pharmacist will think of trying to do business without belonging to his local organization any more than he now tries to get along without a bank account and credit with manufacturers and jobbers.—*Meyer Brothers Druggist.*

Section on Education and Legislation

Papers Presented at the Fifty-Ninth Convention

MEMORIAL PRESENTED TO THE COMMITTEE ON WAYS AND MEANS OF THE HOUSE OF REPRESENTATIVES.*

GENTLEMEN: — Representing the American Pharmaceutical Association, founded in eighteen hundred and fifty-two, and always, since then, actively and earnestly engaged in promoting the public welfare, in connection with the practice of pharmacy, the undersigned, chairman of its Committee on National Legislation, begs leave to read from the records of its last annual convention, held at Richmond, Virginia, May, 1910, as follows:

"He (Mr. Hilton) moved that the Association go on record in support of the Foster Bill, with certain modifications."

"He (Mr. Hallberg) moved, as a substitute, that the recommendation be changed to the effect that this Association approve any proper regulations for the handling of narcotic, habit-forming drugs in interstate commerce.

"This motion was seconded by Mr. Dittmyer of West Virginia and carried."

In the Association's behalf, I respectfully submit, for your careful consideration, the following comments upon H. R. Bill 25241, introduced by Mr. Foster of Vermont, April 30, 1910, and printed:

First: That the list of drugs and chemicals appearing in Section 1 is incomplete, since it does not include a number of synthetic products, namely, alypin, novocaine and holocaine, which are neither derivatives nor salts of any of the drugs nominated, but which have the same harmful and destructive qualities as cocaine, also that no provision is made, if possible to control the importation and sale of other synthetics of like nature that may be subsequently introduced. Special attention is also called to the desirability of mentioning the trade marked name of such a derivative as diacetyl morphine, marketed as "heroin."

Second: That it is practically impossible to satisfactorily or effectively separate manufacturers and dealers, to be registered under the act, into the wholesale and retail classes provided for; the lines between these, in many and nearly all cases, is imperceptible. A large number of jobbers sell at retail and many more retailers sell at wholesale. Nearly all retail pharmacists manufacture these, so-called, original drugs into their various preparations. It would seem wise, therefore, to have but one class of registered dealers under this act, each paying a uniform fee of, say two dollars and that the bond of each shall be in proportion to the amounts of these drugs a person may handle.

Third: That Section 2 is involved, ambiguous and not in accord with Section 6. Also that it is faulty in the provision that requires a special tax to be paid upon crude products and allows alkaloids and alkaloidal salts, that are separated

* From the Report of the Committee on National Legislation, read at the Boston Meeting, 1911.

and made from the crude drugs, to be imported into this country free of the special tax and entirely without control, which would seem to render the act non-effective in the very object sought to be obtained.

Fourth: That the proviso of Section 2 is too greatly restricted and the privilege given to the "duly registered and bonded manufacturing chemist or manufacturing pharmacist" should be extended to any person duly registered and bonded under this act.

Fifth: That the absolute prohibition of interstate commerce in these drugs, except between those registered under this act, as provided for in Section 4, will entail unjust, unkind and injurious hardships upon many citizens residing near the border lines of our respective states and upon those citizens who may temporarily reside outside of their own states and away from their regular physicians and pharmacists. It would therefore, seem that legitimate sales on the original prescriptions of physicians should be exempt from the operations of this law. To the several states must be left the control of the writers of prescriptions, within their respective borders.

Sixth: That Section 6 provide a penalty for the non-payment of the special tax on the salts, derivatives and preparations of the cited drugs, when no provision for the laying and rating of such a tax has been made.

Because of these facts and to make our contentions more explicit and exact, I most respectfully submit these several amendments for consideration:

Amend Section 1, page one, by striking out all after "opium," line 4, up to "and," in line 6, and substitute the following:

Morphine, diacetyl morphine, heroin, codeine, cannabis, hydrated chloral, holocaine, novocaine, alpha-eucaine, beta-eucaine, alypin, coca leaves, cocaine, their salts, derivatives, preparations or compounds or any substance or synthetic product or chemical that may be used as a substitute for cocaine, or having the same local stimulating effect as cocaine, under whatsoever name it may be known or described.

Amend Section 1, page 2, line 1, by striking out the word "or" and inserting a comma; lines 2 and 3, by striking out all after "jobber," up to "retailer" and by substituting a comma and the words, "dispensing pharmacist"; in line 5, amend by changing "one dollar" to "two dollars."

Amend Section 2 by including the full list of drugs, chemicals, etc., that is cited in Section 1 and by making proper provision for an equitable tax rating, on each of these. Also amend Section 2, page 3, by inserting after the word "any," in line 11, the word "person," and by striking out the words: "manufacturing chemist or manufacturing pharmacist" and inserting in their place the words "under this act."

Amend Section 4 by introducing, after the word "to," line 20, the words, "the dispensing of the original prescriptions of legalized practitioners of medicine, to."

Section 6 will need no amendment if Section 2 is amended to conform with Section 1; otherwise, Section 6 should be made to agree with Section 2 as now constructed.

HENRY P. HYNSON, *Chairman.*

Section on Practical Pharmacy and Dispensing

Papers Presented at the Fifty-Ninth Convention

SANITATION IN PHARMACY.

J. LEON LASCOFF.

In my practical experience as a pharmacist I have observed that the necessity of cleanliness is more urgent in our business than in any other. At the June, 1911, meeting of the New York State Pharmaceutical Association, held at Alexandria Bay, I presented a paper entitled "The Essentials of a Reputable Pharmacist," in which I mentioned among other things, the necessity of sanitary conditions in the pharmacy. In that paper I laid out certain rules and among those rules I called special attention to sanitation.

The definition of the word sanitation is, devising means for promoting public health and the removal of elements injurious to health. We pharmacists must by all means pay more attention to cleanliness than an ordinary storekeeper. We do not want to classify ourselves with them but since the enactment of the pure food law the sanitary conditions of groceries, delicatessen stores, dairies and butcher stores, are far superior to some drug stores.

What is the result of improper sanitary conditions?—disease, which is not a necessity in the world. It is an indication that something is wrong. Call this something what you may, it can all be included in one term, "dirt." Dirt is the abomination of humanity. It is the cause of most of the diseases and ailments of mankind. Whenever cleanliness is not observed, sickness is rampant. The bubonic plague in India and China, the sleeping sickness of Africa, the cholera and smallpox of Eastern Europe, the yellow fever of tropical America are all products of unsanitary conditions. The Great Plague and Black Death which spread over Europe early in the thirteenth century, snuffed out millions of lives, taking their most violent hold upon those places where streets were narrow and congested, houses ill-kept and dirt thickest. What is causing the great infant mortality, the great unnecessary murder of civilized communities?—Crowded conditions, slums, bad milk and impure air. What are all these but varieties of dirt? Think of conditions existing in Cuba and the Philippines, before the United States Government took possession. The white man could not live there. Yellow fever and other diseases were abundant, but now sanitary conditions are far better and diseases become rarer and rarer every day.

What is the greatest function any health department has to serve? That of compelling people to observe the most ordinary rules of cleanliness and sanitary conditions. The necessity of absolute cleanliness in all phases of life, at all times, is impressing itself more and more thoroughly upon all thinking beings. Pure

food laws are being passed, sanitary care of cows and milk is being enforced, clean streets are called for, disposal of garbage is being faciliated—everywhere improvements are being made. Sanitary bakeries are being erected, Red Cross barber shops opened, clean grocery stores, meat shops and delicatessen stores are called for. If it is imperative that the grocers and butchers keep sanitary conditions, how much more so is it for the druggist? He comes in contact with people at the most critical periods of their lives. At those times absolute cleanliness is essential. If improper conditions can kill a healthy person, how much more likely is it to do so, when the system is already poisoned with impurities, and already exhausted by disease.

The following is an extract from an article published not long ago in one of the California medical journals, calling attention to a dirty practice in many bakery stores: "The paper for wrapping cakes, etc., is in sheets, and when the saleswoman reaches for a sheet, she usually holds the loaf of bread or cake in the left hand and reaches for the sheet with her right hand, wetting her thumb with saliva, to facilitate the quick detaching of the top sheet on the pile. Then, frequently that part of the paper which she has moistened with her spittle is turned in and wrapped against the food that is later eaten, thus transferring some of the sputum to other people. One can imagine the danger of such a practice from an example seen, where a woman known to be syphilitic did precisely this thing."

The use of paper in rolls would go far to stop this practice, for there is not the necessity to wet the finger in order to separate one sheet from another.

I could mention a case where a physician lost a valuable patient on account of the unsanitary condition of his office. While the patient was perfectly satisfied with the treatment of the physician, the general appearance of the office disgusted him. A trained nurse, a friend of mine, told me of several instances where she was compelled to change the druggist on account of the filthy and dirty conditions of the store.

A few facts which I wish to bring out in reference to sanitation in the department bear upon the subject of sterilization as a means of bringing about proper sanitation in different instances. I shall mention as the first example the common abuse which is practiced in almost every pharmacy, and yet has been given little or no attention from the standpoint of sanitation, the returned magnesia and other medicine bottles. The bottle which has been in the sick room is returned to the pharmacy where it is usually washed in the ordinary way, refilled and then offered for sale to someone else. This bottle may have been in a room where some contagious disease was prevalent and allowed to remain, and by a natural course of events the disease germs find their way in and around the bottle, especially the rubber washer. Ordinary washing and scouring with hot water is not satisfactory for destroying pathogenic germs. All bottles so returned should be thoroughly sterilized as well as cleansed, and for this purpose I have devised a formaldehyde dry sterilizer, consisting of a zinc or tin cabinet with perforated shelves, upon which the bottles can be placed side by side. The solution (formaldehyde potassium permagamate) is placed at the bottom of the cabinet,

and the door tightly closed and sealed by means of rubber or leather strips (such as are used for weather strips). The generation of formaldehyde gas then goes on and sterilization is usually complete in about one hour or more.

This box can be constructed from wood, but should be metal lined, and under any circumstances must be hermetically sealed to block the escape of gas. The cost is trivial; it does not require attention, and as there is no heat or effervescence it is absolutely safe. In fact it is a simple process of fumigation, such as is practiced by the Health Department of New York. Any utensil or receptacle may be so fumigated.

Another point that is worth while mentioned is keeping the upper rim of the mouth of a bottle clean and dust free, which can be done by placing a ring of paper or celluloid cap over the mouth. Then when the medicine is poured out there is no contamination. The rings are made of celluloid chips, and with little trouble to the pharmacist.

The glass-top counter is by all means the ideal fixture in the perscription department and can be easily cleaned and sterilized when necessary.

Cleaning of mortars and pestles by scouring and burning out by pouring into the mortar about 1 oz. of denatured alcohol and lighting until consumed makes them absolutely sterile.

Careful cleaning of spatulas and ointment boards (which should always be of glass or porcelain) because ointments should be sterile, as well as in any other surgical dressing.

Most important of all are solutions prepared for subcutaneous and deep injection, such as cocaine solution, mercury salicylate in albolene, camphor and oil. When preparing these see that the vehicle is scrupulously clean and free from any visible foreign substance. The medical journals are full of accounts recording deaths due to carelessly prepared solutions for hypodermic use.

Paper towels are more sanitary than cotton ones, as they are destroyed after use and are inexpensive.

In making pill masses and rolling out pills it has been the routine habit to take up the divided mass and roll between the fingers to bring about the spheroid shape. In my opinion this is a very unsanitary and very filthy habit, as hands cannot be kept clean enough to insure the patient against swallowing some germs or filth that may have found its way into the pill in manipulation. I use very soft tissue paper in the hands and pick up the mass or pill and roll between the paper in the same manner as without the paper, which in my opinion is a cleaner and safer method.

In counting out pills, tablets and capsules from the original container into the dispensing receptacle never drop into the hands but directly into the box or cover thereof; in other words do not handle the pill or tablet but pass from one container into the other.

Many other minor points could be mentioned but are self-evident; such as a proper washing sink for employees, clean towels; condition of shelves and floor, etc. Absolute cleanliness should prevail in the entire makeup of your establishment. I bring this before you as a warning, as a suggestion to bear in mind that

sanitation should be equal to your accuracy in dispensing. That no compulsory sanitary code has ever been enforced affecting pharmacists seems to me to have been the result of oversight. In my humble opinion there should be a set of rules adopted by the Board of Pharmacy covering just such points as I have laid before you, and enforced as are the other laws. But, inasmuch as these do not exist as yet and the matter is left entirely to the discretion of each individual pharmacist, as a matter of fair play to yourself, employees and especially to the public, a reformation of present lax sanitary observances is by all means necessary. We, as professional men, dealing with the sick and those who are at our mercy, must needs follow in the naturally rapid strides made by "up-to-date" scientists and carry out the simple rules of sanitation and sterilization, and not until then do we fulfil our duty to the best of our ability, nor can we conscientiously state that we have given the public the best that is in us and the best for their own good and welfare.

A HOMEMADE STILL FOR RECOVERY OF ALCOHOL.

J. H. BEAL, PHARM. D.

The following simple and inexpensive piece of apparatus has been found efficient for the recovery of alcohol from the weak percolates obtained in the manufacture of fluidextracts, and from similar liquids.

The advantages of the still are its cheapness, and the fact that the liquid can be evaporated directly from a porcelain evaporating dish, thus avoiding the use of a flask.

The apparatus is composed of two enameled iron pans, one constituting the still body, and the other of slightly smaller diameter, so that when the latter is inverted its rim will fit neatly into the larger pan about one-third of the distance from the bottom of the latter. (Fig. 1.)

Through the bottom of the smaller pan, which constitutes the dome of the still, is punched a hole about 2.5 cm. in diameter into which a perforated cork is tightly inserted, and made vapor-tight by a luting of plaster of paris. Through the cork passes a curved glass tube which is connected with a Liebig or other condenser.

A second similar opening serves for the addition of fresh liquid, or for the insertion of a thermometer.

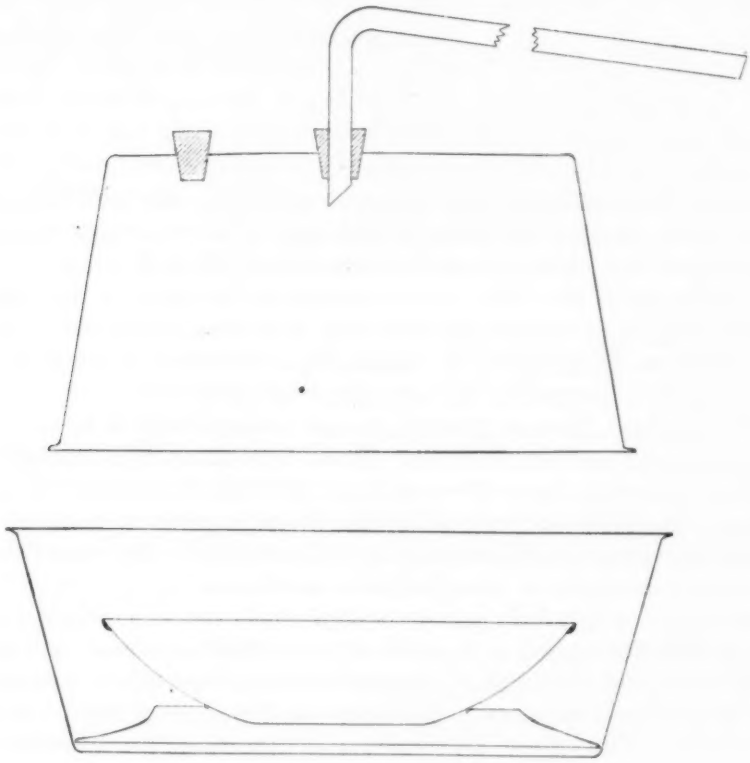
As a support for the evaporating dish there is used an ordinary pieplate in the bottom of which is cut a circular opening of a diameter sufficient to hold the evaporating dish, so that the bottom of the latter will be elevated about 1 to 2 cm. above the bottom of the still.

The evaporating dish and contents having been placed in position, the dome is placed over it and water poured into the lower dish until the level reaches above the margin of the dome, the water acting as a bath and also as a seal to prevent the escape of vapor.

Instead of water, glycerin, petrolatum or other liquid may be used, and for the recovery of alcoholic distillates is to be preferred.

If the vapor pressure tends to lift the dome from its position, it can be held in place by weights or by being wired down.

The cost of an apparatus of size sufficient to take a porcelain evaporating dish holding one liter should not exceed 25 to 30 cents.



A somewhat more efficient apparatus can be made by an average tinsmith as follows:

The bottom pan, or what corresponds to the body of the still, is made of copper or heavily tinned iron, and has soldered to its outer rim a gutter into which glycerin or other liquid can be placed as a seal, the edge of the dome resting in this gutter when the apparatus is set up.

If a piece of thick, soft twine, or candle wicking is laid in the gutter before the dome is placed in position the joint between the upper and lower halves of the still is made more nearly vapor-tight.

The dome can be held fast to the body either by wire or by stout twine passing over hook-like flanges attached to the dome and body respectively.

Section on Commercial Interests

Papers Presented at the Fifty-Ninth Convention

FACTORS CONSIDERED IN THE EXTENSION OF CREDIT.

C. MAHLON KLINE.

Credit is the backbone of modern business. With it, a man can command more capital, do more business and make more profit. The advantages of credit, or rather its possibilities, when properly used, are so generally recognized in the business world that it has often been a question in the mind of the writer why more retail druggists did not avail themselves of it, especially in the direction of obtaining loans to discount bills, by which they could obtain a much larger rate of interest on their money than the rate charged for the loan.

Generally speaking, there are three factors to be considered in the extension of credit: capital, capacity and character. To the student of credit conditions this statement is elementary, but to those of you who have not made credit a special study, it may be of interest to explain the relative importance of these factors. Credit may be extended on the strength of the existence of any one of them, but in no case can it be extended where all three are absent.

You may not be aware of the fact, but capital alone, regardless of character and capacity, entitles the possessor to credit in reasonable amounts. A man notoriously dishonest, and of no ability, provided he has a clear title to valuable property, can secure credit more easily than a man without capital and of admittedly good character. The reason for this is, of course, obvious. The laws of the country are so drawn that the creditors run a better chance of securing their money, if necessary, where capital is in existence, than they do where the ability to earn capital may be present, but which remains to be demonstrated. For this reason we very often see the example of a man without capital obeying moral laws and conducting himself in a decent Christian way, simply and solely because he realizes that in the absence of capital he must demonstrate character. Very often this same man, after his career has been crowned with wealth, will forsake utterly the principles that have guided his steps, and will attempt to defy moral laws and put aside Christian virtues, because he vainly imagines that his wealth places him beyond the control of the laws of God and man; and indeed, we are daily accustomed, in these modern days, to the spectacle of such a man continuing to live as he sees fit without the loss of either commercial power or wealth.

To turn to the second factor, that of capacity; capacity without capital, but with character, is an exceedingly important consideration in the retail drug business. The business is of such a nature that not very much capital is required, and if a man whose capacity is known, and whose character is above reproach, comes

to a supply house, the credit extended to him is often surprisingly large. On the other hand, capacity without character or without capital may be of value when properly controlled, but it is very seldom that a man of this kind meets with any measure of business success. Credit men have a little habit of inquiring into the character of the individual, and where wine, women and song are indicated, the individual receives scant consideration. I have known credit to be refused on immorality alone, simply because it is well known that immorality quickly undermines character and leads to financial downfall.

One of the misfortunes of the retail drug business in the past has been the fact that retail druggists knew little or nothing of the economic principles of the business world, and tried to do business by ignoring them. Today, under the leadership of the national pharmaceutical organizations, this condition is being rapidly changed. Furthermore, the colleges of pharmacy are seeing the signs of the times, and are giving special courses of commercial training to their students, a practice which cannot fail to make good business men as well as good professional men.

An able credit man has to take chances. He has to trust often largely to instinct, and is, of course, often sadly misled. It is very necessary, however, that he take risks, or else he will not be making the best of the possibilities of his position. The credit man who has no losses is not a good credit man; it means that he is losing more business than he should. In modern business losses up to a certain point are considered perfectly legitimate. If the labors of a credit man selling as he does in the territory within a radius of some hundred miles, are trying, how much more trying must they be to those who sell in foreign lands, more particularly those lands which are constantly in the turmoil of political upheaval, where a man may be a millionaire one day and a beggar the next. Those who sell goods in South American countries are particularly exposed to this sort of risk. Often a shipment is started to a man having the best of credit, and while the shipment is on the way this man's capital and belongings are wiped out of existence and his bills remain unpaid.

I heard of a case in New Orleans where a furniture company lost $10,000 through a political upheaval of which they had no forewarning and of which they were unable to recover a cent. The consignee was an honest man, but of a different political belief than the revolutionist, who confiscated all his goods and deprived him of his resources.

It seems peculiar, but nevertheless it is a fact, that when once financial institutions form the habit of extending credit to an individual or company it is easier for such to continue borrowing than it would be had they never before asked for such an accommodation. To illustrate my point; I quote a peculiar case that came to my attention of a man conducting a business that had so much capital and the earnings of which were so large that they were never accustomed to ask for loans of any kind, but paid dividends and discounted all bills with cash at the bank. This man found that he could use $10,000 to advantage, and went to one of the banks where he had maintained a cash deposit for years, and asked for a loan. The bank immediately began to ask him questions which made him so angry that he advised them to depart for a certain place where the climate is said

to be hot, and went to another bank, where he was accustomed to keep, also, a considerable cash deposit. This bank treated him no better than the first, which so annoyed him that he decided to go no further.

Where banks are accustomed to extend credit they will frequently loan large amounts on short notice. Where a company has existed for years without borrowing, any attempt to borrow immediately arouses suspicion. It is, therefore, undoubtedly good practice for a man, or company, to borrow money from time to time, just to get the financial community accustomed to loaning to him.

The factor most considered by banks in the extension of credit are the quick assets. Quick assets consist of stocks which have a fixed market value and can be disposed of at short notice, accounts receivable which are due from customers in good standing, and, of course, cash on hand and in bank. Many other assets which might be considered excellent cannot be taken into account, because they are of such a character that should the bank come into possession of these it might take considerable time and expense before they could be converted into cash.

In presenting these few elemental facts I realize that those who have made a study of credit conditions will find nothing new or instructive in my remarks.

Credit, as practiced today in the commercial world, is the foundation of all business operations of any magnitude. A thorough understanding of credit will be a valuable thing to you, because you will never know when the time may come when a knowledge of the opportunities afforded to obtain loans may affect very seriously your successful business career.

If, therefore, I have started any one thinking along these lines, I will feel that this paper has not been presented in vain.

THE DRUGGIST'S STRONGEST ASSET—CREDIT.

JOHN R. THOMPSON.

You might have $25,000 in bank and still not be considered a desirable customer by merchants and manufacturers. On the other hand, your bank balance may be very small and cause you no embarrassment, if you are prompt in paying your bills. A strong credit is built up by the method you employ in making settlement, and not by a strong showing in assets.

A bank will lend money and a merchant will give credit more readily to the druggist who has a reputation for prompt payment, even though he may be only moderately rated, than to the man of reputed wealth, who is slow to liquidate.

Good credit is more to be desired, as it is more useful to the business man, than lots of property.

The firms who sell you goods are not interested in what you are worth particularly, but they are alive, indeed, to whether you do or do not pay when your bills are due.

The proportion of druggists who discount their bills is larger than one would suppose on first thought. It varies in different localities, like everything else. In

Pittsburgh about 80% of druggists discount. In Philadelphia about 60%, in New York 60%, in Boston 80%, in Baltimore 50%, in Chicago and most western cities about 75%. Cleveland and Cincinnati, both in the same state, vary from 80% in the former city to 65% in the latter.

These estimates apply only to city druggists. In the country districts the proportion is larger in the West and smaller in the East.

Take as a general average we will say about 70% of druggists discount promptly. This is a good showing compared with other business of comparative size. Grocers and other merchants do not discount in any such proportion. Department stores, with scarcely an exception, discount all bills.

The merchants in all lines who discount are the ones who are making money. Those who do not are the ones who simply exist or fail.

This is esaily accounted for. The man who is prompt in payment is also prompt and forethoughtful in all his actions. He is a good buyer and will not overstock; he is a good salesman and will get rid of goods somehow which have ceased to be sellers; he is a good manager and will not allow extravagance and negligence to escape notice. He is a good business man all round *because* he discounts. He discounts because he is a good business man.

The direct profits to be made by discounting, aside from establishing credit, are large in themselves.

A druggist purchasing ten thousand dollars worth of goods a year will realize a hundred dollars if cash discounts are only one per cent and in many cases they are two and three per cent. To clear up a hundred dollars net by selling goods you must handle about a thousand dollars worth of merchandise.

The advantages of discounting, therefore, are: The direct profit in it; the building of credit, and the acquisition of good business habits. These three qualities will make business a success anywhere in the world.

DISCUSSION.

CHARLES HOLZHAUER: "I used to be indifferent about paying my bills, but woke up one day to the fact that I was losing money by the practice and began discounting my bills. When I needed money I went to the bank and borrowed it.

"I think it is a subject that every one in the retail drug business should take to heart. If you have good credit with your banker you need not tell your jobber you are borrowing money to pay his bills, but just pay him. It is a good thing for a man in business to have a good line of credit, not only in one place but in several places.

"I remember a case similar to the one mentioned in the paper, where of two men one said, 'I will pay cash for all my goods and never borrow a cent'; the other said, 'I am going to borrow all I need.' When there was a financial crisis the man who paid cash for goods couldn't borrow a cent; the other man had no trouble for he had established his credit. My advice to any young man would be to borrow on short time and pay when due, then he can get more the next time and can get it for a longer term.

"The basis of credit depends very largely on the standing of a man in his community and the keeping of his word that he will pay at a certain time."

D. A. MILLER: "To the statement in Mr. Kline's paper that it is a good policy to borrow money, I would like to add my testimony that he is absolutely correct. As Mr. Holzhauer has advised, the young druggist should aim to establish a line of credit as soon as possible. The usual rule with banks is that at least 25 per cent. must be left in the bank. It is also a cardinal principle that loans must be paid punctually when due. It is the business of banks to loan money; it is their only method of making a profit.

"It is with great reluctance that wholesale druggists accept notes from their customers. One of the best things a retail druggits druggist can possibly do is to establish a line of credit with one or more banks as soon as possible."

H. B. MASON: "Not only is it a source of profit to the druggist to borrow money and discount his bills, but there are numerous other ways in which he can profit. I don't suppose any fortune has been built up in this country out of what a man can save of his own earnings. It is the general rule that you prosper by using the other fellow's money. If you can get money at 5 per cent., make it yield 15 per cent. It is like a profit on merchandise, only quicker and better.

"The question has been raised as to what method banks use in loaning money. There is really no rule so far as I have been able to discover. A man who has not an established business usually finds it necessary to put up collateral. If he has a business in a good locality he can usually trade upon that business with the bank. I do not think that banks base their loans upon a certain percentage of deposit. Every banker is a law unto himself; if he likes the appearance of a man and knows his character to be 'A number one,' he will not hesitate to make the loan. As has been pointed out, the more you borrow money the easier it is to get it. There is no doubt in the world that most druggists fail to use their banks as they should use them."

"Most druggists are of the opinion that the borrowing of money is an unsafe practice. I know one druggist who has two or three stores who started in business twenty or thirty years ago with a prejudice against borrowing money. He has expanded rather largely and recently opened a new store, and suddenly found that he did not have quite enough ready money to swing the deal. Instead of doing as a wise man would have done and borrowing $5,000.00, he did not go near the bank, but held up his creditors, with the result that the jobbers and others from whom he buys supplies have come to the conclusion that he is an unsafe risk and in two or three instances have refused to ship him. He is worth perhaps $30,000.00 in excess of his liabilities, but as he was holding up his creditors on one pretext or another they were afraid they would not get their money and denied him credit. The man who borrows money at the bank, discounts his bills and keeps things going is in much better position to do business with his jobber and supply man."

S. H. SCALLIN: "There is one feature of borrowing that has not yet been touched upon. Some people when they go to the banker think it is none of the latter's business what the borrower is doing with the money; it is his business. He is not loaning his own but his depositor's money, and it is right that he should know something about the character of the investment you desire to make. In my portion of the Middle West, South Dakota, there is no requirement as to your bank balance; it is a matter of character and business ability. If these are all right the banker will go a long way to help you."

SOME EVERY-DAY PROBLEMS.

CLEMENT B. LOWE.

The Sunday closing movement is gradually attracting attention and some progress has been made towards shorter hours on this day, which to humanity is, or should be, a day of rest; especially is this so in the summer time when there is such an exodus of people from the cities. Those who do not close during the hot Sunday afternoons of summer are probably largely influenced by the business to be done in soda water, cigars and candy. In a long pharmaceutical experience the writer has never opened his soda fountain on Sunday; it has been his endeavor to restrict business on this day, rather than to attract it, he has felt that it would not

be Sunday to him if he were to serve behind a soda fountain on this day, and it has been a principle with him to not require of a clerk a service which he would object to rendering himself.

Sunday closing during the cooler months of the year is still with us an unsolved problem, outside of opening later and closing earlier. The prescription business in winter is often so heavy on Sunday as to keep those on duty rushed during the whole day; if the business was to be thrown into shorter hours it would require an increased force, this could not be drawn from the regular force without depriving them of their day of rest, and extra help is hard to get and frequently not worth much when obtained. Some of the reasons why the prescription busineess is frequently so heavy on Sunday are the following: Sundays are largely used by the laity as days for physical repairs, they put off treatment, sometimes under the pressure of necessity, until the first day of the week is reached, when they lay up for repairs and send for the doctor. Doctors themselves are often to blame for the Sunday traffic as they hold out inducements for visits from patients on this day. We have always admired the physician who had the wisdom and courage to announce "no office hours on Sunday," wisdom because he recognized his own spiritual and physical wants, and courage in the endeavor to satisfy them. In addition it implies that such a physician has been so successful that he does not have to cater to the Sunday traffic, he can make a living without it.

To sum up. First, while cooperation on the part of one's pharmaceutical neighbors is desirable, don't wait too long for it; be a leader and set the pace. Second, the attention of physicians might be called to the desirability of limiting their practice on the Sabbath. Third, a campaign of education for the laity might be entered into and an endeavor made to secure their cooperation.

Closely related to the shorter hours on Sunday, is the question of shorter hours during the week. To my mind there is not a question but what the hours of service in the drug store are unnecessarily too long. Some years ago the grocers of the City of Brotherly Love kept open every evening until 9 o'clock. On the surface this seemed praiseworthy as apparently they were catering to the necessities of their fellow men. However, it dawned upon them that these wants could be supplied in a shorter time, so that now they close their stores on five days of the week at 6 p. m. and no one is seriously inconvenienced.

If drug stores were closed earlier it might result in the wiser of our customers keeping on hand some of the simple remedies, for there is no reason why the drug store should be kept open long hours to relieve every possible head ache or stomach ache. The city store could close in the winter at 8 p. m., in the summer at 9 p. m.; country stores earlier.

The long hours spent in the store take the snap and too often the health out of both proprietor and clerks; they deprive them of social recreation and the opportunity for mental improvement. A strong argument for early closing is the fact that the present long hours of service deter many young men from entering the business; they can make as much in other lines of business where the hours of service are shorter. In conversing with the manager of a large druggist's sundry house, he told me of the long hours of service which he put in as a boy, and the resolution which he then made "to shorten the hours," if he ever had the oppor-

tunity. Gradually by his influence, the time has been materially lessened by his firm without injuring the business. In fact, they are getting more work out of a smaller force at the present time than they were ten years ago out of a larger one.

I think pharmacists themselves are largely to blame for the long hours of business. In their greed for business they have lengthened out hours of service until they have educated the public to believe that what was at first a favor is now a right. I have noticed at times young men rail against the long hours and other hardships of the business, and yet when they became proprietors of stores they have failed to practice what they formerly preached. I have heard a proprietor excuse the treatment of his clerks by saying, "I had a hard time when I was an apprentice and they are no better than I was."

The writer thinks a distinct gain was made for pharmacy by the efforts of the N. A. R. D. to reduce the pricing of prescriptions to a uniform basis, not that he, or probably the majority of pharmacists follow the N. A. R. D. plan in its entirety, but it has been quite a help in securing uniformity of prices. I have heard it said, but of course I don't believe it, that the plan in some stores years ago was to size up the customer and charge him as much as could be done without his squealing. I, however, know some cut-rate stores where the prices for prescriptions are very high. One of the principle advantages of the N. A. R. D. plan is that it puts a value upon "the know how." A long apprenticeship, a college education and a state board certificate should all have a money value, therefore the time spent in compounding a prescription should all be taken into account in fixing its price. I have wondered why pharmacists in giving a copy of prescription do not always mark upon it in the N. A. R. D. cost mark, its price; nine out of every ten pharmacists would probably honor it, and the tenth will quote a lower price when the cost mark is absent than when it is present. The extreme cutting of prices as carried on some ten years ago has given way generally to a more reasonable state of affairs—the "live and let live" motto has had a good effect. The value of cutting of prices is at least somewhat problematical; it depends largely upon the situation of the store. If the trade is largely of a transient character it may be necessary to attract attention by so doing, or at least by having bargain days or bargain sales; in a residential district it seems to me that it is better to attract attention by emphasizing quality and superior service, for trade won along the latter lines sticks. It is sometimes said that owing to the ability of the large stores to buy in quantity they can secure lower prices, and can therefore afford to cut, but it must not be forgotten that the expense of these large stores is enormous and they can no more live without a profit than the small store.

Pharmacists often needlessly throw away profits by getting into an ugly mood. A pharmacist, the owner of a long-established store in a prosperous suburb of a city, was noted for his high prices. Owing to the growth of this section of the city another store was established, which undertook to sell at the prices of the older druggist so as not to antagonize him, but the older druggist in order to kill off the newcomer commenced a sharp cutting of prices, which however failed of its purpose. Probably this druggist has lost more by these needlessly reduced prices than he did by loss of trade, as there was plenty for both.

One of the problems that confronts the pharmacist is that of "keeping sweet";

the business is one of so much minutia and detail, our employes do not always carry out their instructions, or customers are unreasonable in their demands, so that it is difficult at times to maintain one's mental equilibrium. To illustrate. On a very stormy day in winter when the slush was a foot deep, a lady called up and requested us to send at once for a prescription, put it up, and return it at once. As she lived a mile away, and off of a trolley line, I had to tell her that would be impossible on such an exceedingly stormy day to send at once, as we had to have some consideration for our help. She replied "that wasn't any of her business." I replied, "Directly it isn't, but indirectly it is, for if we are not considerate of our help we won't have any and then it would be impossible to get any medicine to you."

Another case was that of a wealthy gentleman whose child was sick. On such occasions he got quite excited. We had promised him the medicine by a certain time, but he seemed irritated at the necessary delay and called us up several times on the phone. I finally told him that he should have more patience. He replied, "I have no patience, and how can a man be patient when he has no patience."

One of the problems in the drug store is to do the "first thing first." I am convinced that failure to recognize the things that should be done, or deferring the doing of them because they are troublesome, or unpleasant, or because we are in a lazy mood, frequently gets us into trouble, and in time will cultivate in us such a habit of procrastination as to greatly interfere with our success.

Another problem is that of order. "Order is heaven's first law," and should certainly be also that of every well regulated pharmacy. To keep everything in order requires constant vigilance and cooperation of every clerk and assistant. I try to impress upon the boys in the store that the training they are getting is worth more than the salaries paid.

Perhaps I have brought enough problems to your attention to prove that our business is one demanding much thought and careful management. Any one who has become master of its details has received a training which would make him successful in many other pursuits.

DISCUSSION.

THOMAS F. MAIN: "My experience in the retail trade was so many years ago that it would not be a criterion for the business of today. At our store we opened an hour and a half in the morning on Sunday, an hour at noon, and an hour and a half in the evening, and limited sales as far as possible to medicines. The soda fountain was emptied on Saturday night, the show cases containing sundries, etc., were covered, and the keys of the cigar cases collected and deposited in the safe, so that no clerk would be tempted to break the rule on Sundays.

"When we first put the rule in operation the most persistent complaints were from cigar customers. We kept to our purpose, however, and during two years did not find that it resulted in any diminution in sales. I am convinced there is much truth in what Professor Lowe says. In a great many cases the druggist can, with little loss, limit the hours of work on Sunday."

F. C. GODBOLD: "Twelve months ago I concluded to close my store from one to five o'clock on Sunday. I have been closing it at one o'clock but reduced it to three o'clock. I close at one o'clock every Sunday and open at three o'clock, and don't know that I have lost anything."

P. H. UTECH: "I am in a city where there are ten stores. We formed an agreement that two stores were to keep open on Sunday, the others to close. The plan worked until we got around once. The last man who was to have the trade on Sunday said he was going to keep open and the rest could do as they chose about it, which broke up the combination. Finally, I concluded I was not going to be governed by what my competitors did. I got out a letter to physicians and hospitals announcing that I intended closing my store at certain hours on Sunday. Three-fourths of the physicians congratulated me on the stand. In looking over my records I find I have done more business every year since I followed the Sunday closing plan. If I cannot make enough money working six and one-half days in the week, the other few hours is not going to make any difference."

F. H. CARTER: "As to there being an absolute necessity of keeping open all day Sunday to sell drugs, that is largely a fiction. We have shortened our hours greatly."

DR. H. M. WHELPLEY: "When I was a drug clerk we followed the practice of closing from one to five, that is, we closed about one o'clock at night and opened about five o'clock in the morning, seven days in the week. I made some resolutions then about what I would do. I have changed my hours, but not in the retail drug business.

"The interesting part of this discussion is the evidence it affords that it depends upon the individual druggist fully as much as it does upon any combination. These various reforms along commercial lines in pharmacy can be brought about in their order if each man will act on his own initiative and not be too much afraid of what his neighbors are doing across the street."

F. E. STEWART: "I was brought up in Blair's drug store, Philadelphia, where we sold nothing but medicines on Sunday, and when I took charge of a store on Sixth avenue, New York, I adopted the same policy. These stores were closed absolutely on Sunday, and nothing was sold but prescriptions. We had the night bell and nothing but prescription work was done."

DR. JOHN B. BOND: "Everybody knows that the keeping open of a drug store on Sunday is not necessary. Every intelligent druggist knows it is a habit that can be easily gotten along without. The trouble is with the druggist himself. He is avaricious, and his soda water is in many places the best part of his business.

"So far as keeping open on Sunday is concerned, it is a question of avarice. It is not the medicine that is required, but the money-making desire of the proprietor. When you can convert him from that you can close on Sunday and not before."

DR. C. B. LOWE: "This question is a very important one, more important than many realize at the present time. On account of the increased educational requirements for entrance into pharmacy, the tendency is towards high salaries and young men will not go into a business which is so onerous as the drug business is under present conditions. Most of you know how difficult it is to get first-class clerks and, owing to the cutting of prices at the present time, it is not always easy to pay the wages asked.

"It would be easier to get first-class clerks at a fair salary if the requirements of service were not so great. The ordinary custom is for the clerk to work every other Sunday. That is a long day. If you do not believe it, try it yourself. My store is the only one in our section which closes on Sunday afternoon. I think it adds a certain dignity to the store and to the man that can afford to do it.

"When I bought my present store, the manager said to me when I proposed to close on Sunday, "Doctor, you don't know what you are doing." I said, this is a small business, suppose that it loses a little one day, I don't care whether I get it today or tomorrow so I get it in the year."

CHARLES HOLZHAUER: "The store I am conducting was started in 1843, and has never been open all day on Sunday. When I got possession of the store some of my friends said, 'You are foolish not to open this store all day Sunday, it would be the best day in the week for you.' I said, "No, I will not do business on Sunday. I will go out of business before I will do it.' A friend of mine said, 'I wish I could do business as you do it, but I can't afford to.

Sunday is the best day in the week for me.' That man kept on in his way and I in mine. He died a bankrupt and we are still doing business at the old stand.

"We could do an enormous soda water business on Sunday, for we are located on the best corner in the city. On the opposite corner we have a cut-rate store, in the same block on the other side another one, and directly across on the other corner another store, and they all run on Sunday. We don't do the volume of business that the others do, but I have a suspicion that at the end of the year my pocket is as fat as theirs. We are the only ones closed on Sunday, and we get 20 per cent. more on all our proprietaries than our competitors do.

"I would not advise anybody in the matter. It is a question that every one must settle for himself. I believe that any one who undertakes it will find that it is not such a losing game as would appear at first sight. I believe the druggist is entitled to his rest day. We have clerks that we never have to send away, and they are not very anxious to leave us. We get a better class of clerks because we do not run on Sunday, and I believe that we have a better standing in the community.

"We open two hours in the morning and two hours in the evening, because I do not want my customers to feel that I am indifferent to their wants. I believe the best trade appreciates it; they may be put to a little inconvenience, but they are put to the same inconvenience when you are closed at night and don't get angry at you.

"There is compensation elsewhere along the line; you feel more comfortable in the conduct of your business, and that you are treating your help as it ought to be treated. Next July I will have been in business in the same place for fifty years, and if I should be in business fifty years longer I wouldn't run on Sunday."

DR. H. P. HYNSON: "There are three aspects of this question: the moral one, the humanitarian and the business aspect. We older men, because of earlier associations, and because we thought it necessary years ago, are very apt to think it necessary now. There has been a material change in the administration of medicine. The physician who is well equipped now has with him in his hypodermic case and tablets all that is necessary to meet emergencies, and these having been met there is no greater necessity for quick medical application on Sunday than at night; and generally the better physicians do not prescribe a remedy for lengthened treatment until they have had time to study the case. I trust that you young men realize that conditions have changed and that you can close on Sunday much to your own advantage, to the advantage of your clerks, your family and, I believe, to your material interests as well."

H. D. KNISELY: "I have operated one retail drug store for twenty-two years, and have a prescription clerk who has been working in one position for ten years. That store has never run one single Sunday all day. The clerk attends to the store three hours on Sunday morning and I attend to it for three hours in the afternoon. This has been my custom for twenty-two yars and I feel that I have been benefited by it and that the public has been properly served."

THE MOST DEADLY INSTRUMENT.

"The second most deadly instrument of destruction is the dynamite gun—the first is the human tongue. The gun merely kills bodies; the tongue kills reputations and, ofttimes, ruins characters. Each gun works alone: each loaded tongue has a hundred accomplices. The havoc of the gun is visible at once. The full evil of the tongue lives through all the years; even the eye of Omniscience might grow tired in tracing it to its finality."—*William George Jordan.*

Section on Historical Pharmacy

Papers Presented at the Fifty-Ninth Convention

ANTE-BELLUM DRUG PRICES.

P. HENRY UTECH, PH. G.

For the purpose of comparison and possibly, as reflecting the condition of the drug market of this country some fifty years ago, I desire to present for your consideration part of an old drug invoice which I came across recently, together with some comments and observations. The invoice in question was issued by a wholesale jobbing firm of Cleveland, Ohio, and bears date of January 27, 1861—more than half a century ago. On examination it will be found to contain some unique features, together with some interesting prices on the ordinary articles of commerce.

Among such as are particularly conspicious, note the high price asked for potassium chlorate, $1 per pound, while another similar salt of potassium, the sulphate, is quoted at 17 cents per pound, practically identical with the present market price. This extreme difference in cost is readily accounted for when one recalls the fact that the chlorate evidently figured in the manufacture of explosives which had been in great demand during this rebellious period of our country's history. But the greatest variation is in the case of oil of citronella, which as you will observe sold at $7.50 per pint, while the present price is but 50 cents. Other extreme instances of unusually high prices are also noteworthy, e. g., lunar caustic $2.20 per oz.; santonin $2.30 per oz.; saffron $3.00 per pound; ground cassia bark $1.00 per pound; sulphuric ether $1.50 per pint. Two other items, both produced mainly in the South, viz., rosin and oil of turpentine, furnish interesting comment. Scarcity of labor at this particular period caused these two products to reach exorbitant prices, perhaps the highest in their history, turpentine selling at $2.75 per gallon and rosin at 18 cents per pound.

I herewith append the invoice, in part, picking out about twenty-five or so of the chief items and making comparisons as to present-day cost of similar items:

Name of Drug	1911 Price	1865 Price	Per Cent. of Difference
Licorice Root	$0.18	$0.28	56
Potas. Sulphate	.17	.17	00
Ipecac Powd.	3.25	6.50	100
Bals. Copaiba	.75	1.00	33
Oil Citronella	.50	7.50	1400
Caraway Seed	.15	.30	100
Santonin	1.00	2.30	130
Saffron	.45	3.00	567
Resin	.03¼	.18	454
Neatsfoot Oil	1.10	1.85	68

Oxalic Acid	.16	.68	325
Ground Cassia Bark	.18	1.10	511
Camphor Gum	.60	1.50	150
Jamaica Ginger	.30	.70	133
Cubeb Powd	.70	1.00	43
Potas. Chlorate	.16	1.00	525
Spirit Niter	.60	.85	42
Sulphuric Ether	.32	1.50	369
Iodine	3.20	8.75	174
Potas. Iodide	2.35	6.75	187
Oil Peppermint	3.50	5.50	60
Adhesive Plaster	.20 Yd.	.40	100
N. C. Turpentine	.75	2.75	267
Lunar Caustic	.52	2.20	323
Alcohol	2.70	4.40	63

As will be observed, the decreased prices range from 35 per cent in the case of balsam capaiba, to 1400 per cent in the case of citronella. Taking the invoice as a whole and comparing it with present-day prices, the average increase in the twenty-five items herein enumerated is 161 per cent.

The foregoing in many instances would have shown a much greater variation had these comparisons been made a few years ago, prior to the passage of the Pure Food and Drugs Act. Since that date there has been a natural tendency to advance the cost of many drugs and chemicals, which hitherto were supposed to be of U. S. P. quality.

DISCUSSION.

A. W. MILLER: "If I remember correctly, in 1865, gold was selling at about $2.50; everything was naturally two and one-half times the price it would have been if gold had been at par. About that time Oil of Citronella was sold at 50 cents an ounce, as a curiosity. The present price is 25 cents per pound by the drum in New York. Other items, such as turpentine and rosin, were sold at prices that now seem almost fabulous, such as $50.00 per barrel for rosin. Turpentine sold for a time at $6.00 a gallon, simply because communication with the south was barred by our army and navy. For the same reason Seneka Root and Virginia Snake Root sold at prices varying from $4.00 to $6.00 a pound; Opium $25.00 per pound; Quinine $20.00 an ounce. This was in great measure due to the fact that gold was then at a very high premium, or putting it the other way, our currency was considerably below the gold basis."

THOMAS F. MAIN: "It has occurred to me that while the invoice which has been presented to this section is about fifty years old, it might be interesting for the secretary of the section to obtain a copy of an invoice which Schieffelin & Company of New York have; they as you probably know are the oldest wholesale drug house in our city. They have framed in their office an invoice from their predecessors, J. Schieffelin & Company, dated, if I mistake not, 1801, priced in the currency of the country at that time which was pounds, shillings and pence. It would be extremely interesting to have a copy of that invoice preserved by the Association with this one of 50 or 60 years later."

P. H. UTECH: "Doctor Miller's reference to turpentine recalls an incident told me by a gentleman who was one of the first refiners of benzin in America. When this exorbitant price was being asked for turpentine, he conceived the idea of using benzin as a substitute and began placing it on the market for that purpose. Desiring to give it a specific character in the minds of the public he scented it with oil of citronella and named his new product Magnolia Turpentine. There was an enormous demand for it, and it sold at about seventy-five cents a gallon, although the price of benzin at that time was about fifteen cents a gallon.

He took every ounce of benzin manufactured in Philadelphia, buying in carload lots. Upon leaving Philadelphia he sold the recipe to a friend for $1,000.00."

DR. H. M. WHELPLEY: "Speaking of high prices reminds me that the railway hospital at St. Louis once ordered an ounce of cocaine, the purchasing agent not realizling its expensiveness, and the bill was something over $240.00. They kept the article rather than admit that a mitake had been made in ordering. A charity hospital would not have been able to keep it, but a railway hospital could do it, and paid the bill. At that time cocaine was selling for $1.00 a grain."

PROF. CHARLES CASPARI, JR.: "I would like to supplement the remarks of Dr. Miller, to show what a really enterprising retail pharmacist will sometimes do. Very shortly after the introduction of cocaine hydrochloride in Europe, a Baltimore pharmacist wrote Merck & Co., Darmstadt, Germany, and asked them to send him an ounce of the salt. They were afraid to send it and cabled the price, $435.00 an ounce. The druggist cabled back, "Send immediately." He sold the last of the ounce at twenty-five cents a grain."

THROWING AWAY GOOD MONEY.

In all professions and trades, the man striving to reach the top in his particular line, must be constantly learning more about this field, and there are two ways in which he obtains his knowledge.

The first is by the constant association with his business and all its details.

This daily routine familiarizes him with his business to such a degree that it gets to be almost second nature for him to conduct it. But all this merely acquaints him with his business as it is, and in order to keep from getting into a rut and to advance he has to resort to a second course, which is the reading and studying of books and magazines which are devoted to his particular business.

How many druggists read their journals with the idea of getting education from them? Not to just "skim" through them, but to read them thoroughly. None of us know it all, and even if we should come near that mark we need to be continually reminded, and that is one important thing that these journals do; they keep reminding you of certain weak places.

No, it is not good policy, or good judgment, to throw your trade journal on the table or under it, without even taking off the wrapper, leaving it to its fate as waste paper.

What you lightly throw away is often information that cannot be measured in subscription values.

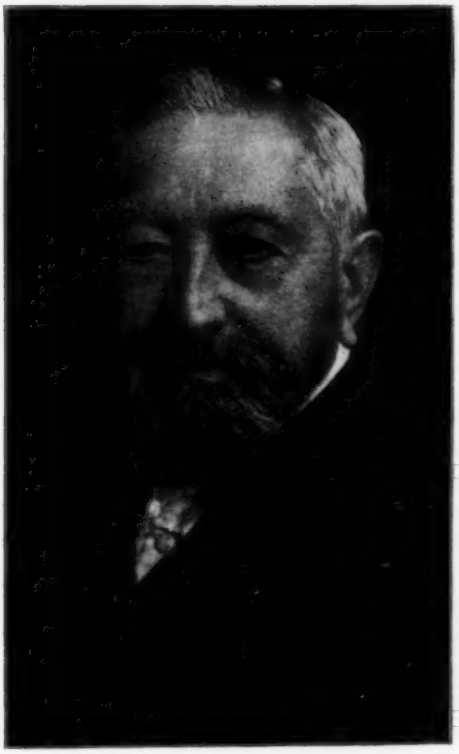
You throw away the summarized experience of men who have specialized along certain lines of drug store success.

You throw away the opportunity to keep in touch with your fellow craftsmen.

You throw away the opportunity to follow the Association meetings, to keep in touch with the bills going through legislature, which bear on the drug trade, to get good live pointers for increasing your business, to learn of many new formulas which in themselves alone will pay over and over the cost of the magazine.

These are but suggestions of the extent of your losses. Only the man who really makes a tool of his trade journals with which to work out a larger business success can actually realize how foolish it is to throw away such an instrument when it is actually thrust into his hands.—*The Apothecary.*

Contributed and Selected



GUSTAV LUDWIG RAMSPERGER.

The applause and honors that are bestowed by the public on men of prominence are not always justly divided, and many a man is raised to a high place of admiration during his lifetime, who hardly deserves such distinction, only to be soon forgotten after his death. The large and unthinking crowd will always be caught by men of daring deeds, of flattering words, of brazen appearance. Men that excel in warfare or showy enterprises, orators that catch their audience by smooth or bold phrases, or those who are endowed with a wonderful voice or other natural gifts, will receive the largest share of public applause; while the quiet thinker, the man who modestly works out hard problems of science or art to the benefit of thousands, the man of stern honor and strict adherence to his duty, no matter how arduous it is, will hardly be noticed.

These thoughts are not new, but they are apt to rise in our minds when we undertake to pay tribute to a dear friend who has stood before us during his whole life as a shining but modest, example and faithful worker, for the good and the

true in our profession. When, about six months ago, Gustav Ludwig Ramsperger, at the occasion of the celebration of the sixtieth anniversary of the German Apotheker Verein, sat next to me, and I had the honor and pleasure of introducing this venerable Nestor of pharmacy to the large audience of his fellow workers, scarcely anybody thought that this would be actually the last appearance among his colleagues. The sweet and cheerful words that he delivered that evening still resound in our hearts and we can hardly realize that this man, whom we were wont to see among us at all festive occasions, will never return. With him the last founder of the German Apotheker Verein, the oldest pharmaceutical association of this country, has passed away, and we might almost say that with him a chapter in the history of American pharmacy has closed. For he represented a time that now lies behind us, that many of us only know from the sayings of older men. New ideas, new commercial conditions prevail today, and many of the old men of thirty and forty—even of fifty years ago—are hardly able to understand this change of conditions. But our friend Ramsperger, though old in years, remained young in heart, and to the very last day of his life he understood and grasped the advances of his profession and took an active part in every development of his calling. He did this to such an extent that in the minds of nearly all of us he does not live as an old man of eighty-eight years, but rather as a vigorous man who works with us, who has been doing this for half a century, and has kept pace in the foremost ranks of his fellow workers.

Let me in a few words tell the history of his life. Gustav Ludwig Ramsperger was born the 13th of December, 1824, as the son of a public school teacher in Herrenburg, Würtemberg. He received his first instruction in the high school of Ulm, and entered at the age of fourteen years the pharmacy of his uncle Berg, in Winnenden, as apprentice. In those days the position of apprentice in a German "apotheke" meant more than we can understand in this country. It was really a practical continuation of the schooling. The proprietor took an interest in his apprentices and gave them regular systematic instruction. They had to perform every part of the work of a pharmacy in a systematic way, never being allowed to pass on to a new work until the previous one had been thoroughly mastered. The apprentices, far from receiving a salary, paid for this instruction, and the time of apprenticeship varied from two to four years in different parts of Germany. At the end of his apprenticeship, Ramsperger passed his examination as assistant and spent a number of years in other parts of Germany and also in Switzerland, where he pursued his studies of French to such an extent that even in his old age he was perfectly conversant with that language. In 1849 he went to the University of Tübingen to finish his studies and to prepare himself for the final examination (Staatsexamen), which he passed successfully in the year 1850. His favorite study was botany, and he had a wonderful memory for the names of plants, and could name their German, French, English, Latin, and pharmaceutical names with equal ease. This memory did not leave him, even in his advanced age.

After passing his final examination Ramsperger left Germany in 1850 and emigrated to America, hoping to find a greater field for his enterprise and ability. Before leaving, however, he married Miss Leonore Wiedersheim, the daughter of a pastor, so that his journey to America was really his wedding trip. There never

was a better mated couple and those who have met Mr. and Mrs. Ramsperger will remember the sweetness and gentleness which characterized them both, until about eight years ago death separated them. Soon after his arrival in New York Gustav Ramsperger acquired a small drug store in Oliver Street, which at that time was right in the business center of New York. His good judgment, his thorough knowledge of all parts of his profession, his amiable manners, and the ease with which he made friends, soon made him the leading pharmacist in his vicinity and his business was one of the most flourishing in New York. He stayed in Oliver Street for sixteen years, when the shifting of the business center and the residential part of the city made it advisable to move further uptown. He bought the share of his friend Faber, in the Faber-Balluff pharmacy, on the corner of Sixth Avenue and Thirty-eighth Street, and was equally successful in this new location. Having acquired a small fortune, Ramsperger thought of retiring, sold out his interest in the pharmacy and for some time devoted his energy to scientific work. But feeling that he was too young for permanent retirement, he again acquired a pharmacy in Brooklyn, at the corner of Fulton and Cumberland streets. Here he stayed a number of years, until, at his sixtieth birthday, he definitely retired from business. Since that day until his death he engaged in scientific and literary pursuits, and was active in a great many chemical and pharmaceutical societies as member and officer.

But the accumulation of a competency was not the sole object of his life. He came to this country not only to be independent and, if possible, to make money; he kept the ideals of his youth as a sacred gift and allowed them to influence him in his actions during his whole life. When he started in business and bought the "Doctor-shop," as it was called at that time, he did not forget the respected position that the German "Apotheker" has among his fellow citizens, and he at once made it one of the objects of his life to help raise the status of pharmacy and eliminate therefrom the foreign and improper belongings. He was fortunate enough to find many companions in this work, men who were inspired like himself, who had also left Germany displeased with the reaction after the great year of the revolution in 1848, and were looking for a broader and better field of usefulness. We must not underrate the spirit of the men of those days. They were really pioneers, they came to this country, not as adventurers, or because they were tired of steady work. They came here instigated by a high and noble ideal, men full of broadness, full of vigor, possessed of high education and ready to give to this country the best that men can bring. It was this spirit that brought men like Carl Schurz, Kudlich, Dr. Abraham Jacobi, Hugo Wesendonk, and others to America. Whatever they undertook was free from selfishness, free from smallness, and their influence was destined to be felt to the good of the country. Animated by such noble incentives Ramsperger and his friends founded the new society which during his whole life remained his favorite work, and for which he has done so much. In the many ups and downs of the Apotheker-Verein Ramsperger always stood firm and lived up to his ideal. He was always in the front ranks wherever pharmaceutical education and dignity were to be advanced. It is easily understood that a man of such inclinations would branch out and not remain within the limits of his home. So he became a charter member of the

New York State Pharmaceutical Association, was a member of the American Pharmaceutical Association, joined the New York College of Pharmacy and acted for a number of years as officer and trustee, his services finally being recognized by giving him the title of honorary vice-president. But while he devoted his principal energies to his profession, and lived for pharmacy, he did not forget other educational enterprises. His love for plants made him join the Torrey Botanical Club, and he was actively engaged in the founding and development of the New York Botanical Gardens. A very extensive and scientific collection of medicinal plants that he made during his life is now a part of the collection of the Botanical Gardens. He was also a member of the American Association for the Advancement of Science, and of the Museum of Natural History, besides belonging to a number of German literary and social associations. His charitable inclinations and warm heart for the welfare of his fellow men can best be shown by the fact that he belonged to twenty charitable societies, worked in all of them, and was president of several of them. And while he was liberal in sharing his earthly possessions with others, the leading trait of his character was his unpretentiousness and modesty, so that even in later years he would not leave the small residence in which he had lived so long, thinking it was good enough for him, until his children, by a ruse, made him leave it for more commodious quarters.

A man of such broad activity in his own profession, of such lively interests for the welfare of others, could not help being noticed and respected all over the country. Thus it was with Gustav Ramsperger. To know him was to love him. Those of us who were regular attendants of the meetings of the American Pharmaceutical Association will recall that in all the little excursions that were made through the country, where plants or flowers were to be found, Ramsperger was always surrounded by a circle of inquiring friends. He knew every plant, he knew the history of every plant, he knew everything that could be known about the plant, and the older of us will also recall that another respected German, a type similar to Ramsperger, Professor Maisch, of Philadelphia, was generally with him at such occasions, and the two were good and dear friends. Of Ramsperger it may be said that he had no enemies. His amiable disposition, his smiling eyes, his cheerful words, always acted as a soothing balsam on unruly spirits. He could not say a harsh word to anybody. He never offended anyone, and if he took a dislike to anyone, he simply avoided him. Thus he stands before us, one of the leaders of our profession, and it may well be worth while to put the example of his life before the younger generation, who often believe that the accumulation of money alone stands for success. Ramsperger's life was a shining example of a great man of his profession, not in the sense of glittering and boasting, but in the sense that the greatest man is he who does the greatest good to his fellow men.

He was a typical American of German birth, of the best calibre. While he remained a German in many of his ways, and preferred to speak German to any other language, and was proud of being a German, still he was thoroughly American, and understood the customs and laws of this country in a noble and ideal way. He was an American not by birth, which often means by accident, but by choice, he loved the country to which he emigrated and was proud to be a good and useful citizen. Therefore he kept all that was good, all that was true of his Fatherland, and brought it with him to this country as a valuable treasure and

gave this treasure to his new country in exchange for liberty and independence that he found here. The devotion to his work, his strong vigor in doing the right thing at the right time, the love for art and science, these were the treasures that he brought with him from Germany and distributed here freely. During the many years of his activity, this virility, this energy and endurance, was the most remarkable trait of his individuality. He seemed never to be tired. He could work for twenty-four hours a day and still be as cheerful and vigorous as when he began, and this power of endurance stayed with him. When in his eightieth year, he took a trip to the Orient in company with a great many others, it was Ramsperger who in Egypt, in Syria, in Palestine, was always at the head of the procession. He took all the little side trips that others only half as old would not undertake for fear of fatigue, and not satisfied with this, he would occasionally sit down and write long reports on his journey which, having been collected afterwards by his son, formed a wonderful narrative of this trip.

Thus Gustav Ludwig Ramsperger will remain in our memory as a noble representative of our profession, every inch a man, without boasting, without advertising, always cheerful, always willing to work, steadfast and true to his better self, respected and beloved by all who knew him.

WILLIAM C. ALPERS.

COMMERCIAL CALCIUM GLYCEROPHOSPHATE.

W. A PUCKNER AND L. E. WARREN.

Glycerophosphoric acid and several of its salts were prepared by Pelouze[1] as early as 1845 while studying the constitution of glycerol. He produced the acid by heating glycerol with phosphoric acid and also with phosphoric anhydride. From the acid the barium and the calcium salts were prepared and the formula $2CaO.C_6H_7O_5PO_5$ (old atomic weights) assigned to the latter. Pelouze reported that the calcium salt was less soluble in hot water than in cold. Soon after the synthesis of glycerophosphoric acid by Pelouze, it was obtained by Gobley[2] from egg lecithin by decomposing this substance with acids. Subsequently Liebrich[3] discovered it in diseased brain tissue and in later time it has been found in a variety of animal tissues and excretions.

In 1876 Thudichum and Kingzett[4] prepared several salts of glycerophosphoric acid from the acid obtained from the brain. They prepared the anhydrous calcium salt, ignited it and weighed the calcium pyrophosphate formed. From the results of these and of elementary analyses of the salt they assigned to it the formula, $CaC_3H_7O_6P$. They also prepared an acid calcium salt from the same source, the formula of which they believed to be $CaC_3H_7O_6P.H_2C_3H_7O_3P$. In addition to the calcium salt they prepared the barium and lead salts but could not obtain

[1] Compt. rend., 21, 718 (1845).
[2] J. pharm. chim. [3], 9, 161 (1846).
[3] Annal. Chem. Pharm., 134, 29 (1865).
[4] J. Chem. Soc., 30, 20 (1876).

the copper or the silver compound in a state sufficiently stable for analysis. The barium compound was remarkable in that, if prepared by precipitation from alcohol, it was found to be a hydrated alcoholate.

In 1894 Portes and Prunier[5] described a process for preparing calcium glycerophosphate. These chemists first prepared the acid by heating 3 kg. of 60 per cent phosphoric acid with 3.6 kg. of glycerol at 110° C. for six days with occasional agitation. After cooling the mixture was saturated with calcium carbonate, the solution filtered and the calcium glycerophosphate in the filtrate precipitated by the addition of alcohol, in which solvent the salt is insoluble. The precipitate was dried in the air, dissolved in water, the solution filtered and the filtrate cautiously evaporated to dryness. The salt prepared by this process is described as a white, somewhat crystalline powder, containing 2 molecules of water of hydration. It is soluble in 15 parts of cold water but nearly insoluble in boiling water and in alcohol.

In 1894 Petit and Polonovsky[6] examined a number of the salts of glycerophosphoric acid. They reported that the calcium salt is a white powder which is soluble in 30 parts of water at 20° C. Other properties of the calcium salt were described, some of which are given herewith:

> On heating a saturated, aqueous solution of the salt a portion of the dissolved substance is precipitated in the form of scales. The aqueous solution of the salt has an alkaline reaction and is precipitated by the soluble oxalates, phosphates and carbonates and by the soluble salts of lead. The aqueous solution is not precipitated by magnesia mixture, by solution of ammonium molybdate in the cold, nor by solution of uranium acetate. If dried at 130° C. the loss should not exceed 3 per cent. If the salt be ignited the residue of calcium pyrophosphate should amount to from 55.5 per cent. to 56.5 per cent.

According to the formula given by these chemists the salt contains 1 molecule of water of hydration.

In 1897 Adrian and Trillat[7] examined seven commercial specimens of calcium glycerophosphate. They found that the product as sold at that time varied much in physical and chemical properties. According to their analyses the several specimens contained calcium equivalent to between 19.5 and 24.5 per cent of calcium oxide (13.9 and 17.5 per cent of calcium), and phosphorous equivalent to between 26 and 33 per cent of phosphorous pentoxide (11.3 and 14.4 per cent phosphorous). Of six specimens two were neutral to litmus, one alkaline and three acid. The solubility in water varied greatly, ranging from 7.6 parts of salt in 100 parts of water for the acid specimens to 4.05 parts of salt in 100 parts of water for the neutral specimens. The portion soluble in alcohol, which consisted of glycerin and phosphoric acid, ranged from 1.8 to 4.2 per cent. These chemists prepared the salt in a state of great purity by a method which differed somewhat from that employed by Pelouze. When first prepared the salt is crystalline but it rapidly loses this property when exposed to the air. The pure salt is soluble in about 22 parts of water at 25° C. Analyses indicated the formula $CaC_3H_7O_6P$. They[8] devised a method for the estimation of neutral glycerophosphates by titration with normal sulphuric acid, using methyl orange as indicator.

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[5] J. pharm. chim. [5], 29, 393 (1894).
[6] J. pharm. chim. [5], 30, 193 (1894).
[7] J. pharm. chim. [6], 6, 433 and 481 (1897).
[8] Ibid. [6], 7, 163 and 225 (1898).

Astruc[9] devised a volumetric method for the determination of the soluble glycerophosphates. He first neutralized the solution with a mineral acid, using methyl orange as indicator, and then titrated with standard alkali, using phenolphtalein as indicator. Determinations of the phosphoric acid by independent methods indicated that the results were slightly below the truth.

Cavalier and Pouget[10] have studied the solubility of calcium glycerophosphate in water at various temperatures. They report that 1000 parts of a saturated, aqueous solution at 16° C. contain 7.9 gm. of the salt; at 36° the amount held in solution is 4.4 gm.; at 51°, 2.3 gm.; at 77°, 1.3 gm.; at 86°, 1.25 gm., and at 100°, 1.15 gm.

Eigelberner[11] prepared calcium glycerophosphate by the method used by Portes and Prunier. He estimated the calcium in an aqueous solution of the salt by precipitating as the oxalate, igniting and weighing as the oxide. The specimens which he prepared contained calcium equivalent to from 21.6 per cent to 22.5 per cent of calcium oxide, the theoretical quantity being 22.6 per cent of the calcium oxide. One commercial specimen of the salt yielded 33.05 per cent of calcium oxide.

Jensen[12] reports that he found a commercial specimen of the calcium salt which he believed to contain dicalcium glycerophosphate. By precipitation with ammonium oxalate in hot, very dilute acetic acid solution he obtained 23.5 per cent of calcium.

Except as chemical curiosities little attention was paid to the glycerophosphates until 1894, when they were introduced into medicine by Robin[13] in the belief that they were of value in malnutrition. Their use spread rapidly and it was not long before they were recommended in a variety of diseases. One or more of the glycerophosphates is described in nearly every foreign pharmacopoeia. The therapeutic value of the glycerophosphates has been questioned and conservative writers on materia medica no longer advocate their extended use.

Recent experiments[14] have shown that the animal organisms can build up lecithins, nucleoproteids and other phosphorus-containing compounds quite as readily from the inorganic phosphates as from organic phosphorus compounds. Hence it is probable that the glycerophosphates possess no therapeutic advantages over the inorganic phosphates.

The Council on Pharmacy and Chemistry having decided to consider calcium glycerophosphate, market specimens of different brands were purchased and were examined according to a number of provisional standards for the salt, which latter were chiefly based on the tests found in foreign pharmacopœias. These tests required the salt to be soluble in 30 parts of water. All but the merest traces of heavy metals were excluded. A limit test for carbonate, which permitted about

[9] J. pharm. chim. [6], 7, 5 (1898).
[10] Bull. soc. chim. [3], 21, 364 (1899).
[11] Am. Jour. Pharm., 76, 212 (1904).
[12] Evans' Analytical Notes, 6, 18 (1911).
[13] Bulletin acad. med. [3], 31, 419 (1894).
[14] Fingerling, G.: Die Bildung von organischen Phosphoverbindungen aus Phosphaten, Biochem. Ztschr., 1912, xxxviii, 448; McCollum, E. V., and Halpin, J. G.; Synthesis of Lecithins in the Hen. Proc. Am. Soc. Biol. Chem., 1911, Jour. Biol. Chem., 1912, xi, xiii.

1 per cent of a soluble carbonate, was described and limiting tests for sulphate and chloride were also given which permitted about 0.1 per cent each of sodium chloride and of calcium sulphate. The permissible acidity amounted to about 0.7 per cent of free acid, calculated as crystallized citric acid. The alcohol-soluble material was limited to 1 per cent, the loss on drying over sulphuric acid to 5 per cent, the ash between 52.5 per cent and 55.7 per cent, and the calcium between 16.5 per cent and 17.5 per cent. The calcium was determined by oxidation of the organic matter with nitric acid and potassium chlorate, neutralization of the solution with ammonia water, solution of the calcium phosphate in citric acid and precipitation of the calcium with ammonium oxalate test solution.

The results obtained in the examination with the exception of the tests for heavy metals and for carbonates which were negative in each case are tabulated herewith:

TABLE I*

Brand	M. C. W.	P. W. R.	Schering	Squibb	Merck
Solution in Water (1 to 30)	Faintly Turbid	Very Turbid	Distinctly Turbid	Very Nearly Clear	Very Nearly Clear
Calcium	12.73	15.60	15.71	14.48	14.18
Chloride (NaCl)	1.80	0.97	Trace	Trace	Trace
Sulphate ($CaSO_4.2H_2O$)	Trace	1.84	1.04	0.62	0.24
Alcohol—Soluble	0.66	0.73	3.52	6.34	4.47
Cubic centimeters tenth—normal alkali required for 1 gm. of substance†	None	4.47	6.06	12.86	13.66
Loss over sulphuric acid	4.47	3.54	3.23	2.91	2.99
Residue on ignition	51.93	51.01	50.69	47.72	47.84

All of these findings were submitted to each of the manufacturers whose product had been examined, but the key to the table of results was supplied to the individual manufacturer only so far as to enable him to identify his own product. At the same time each of the several firms was invited to criticize the tests in general and the findings for its own product.

While awaiting the criticisms of the manufacturers further experimental work was carried out on the calcium determination. It was found that by rendering the calcium glycerophosphate completely soluble by means of small quantities of citric acid, the calcium might be estimated with a fair degree of accuracy without the preliminary oxidation of the glycerophosphate. The method is given herewith:

From 0.3 gm. to 0.5 gm. of calcium glycerophosphate is weighed into a beaker, dissolved in 50 cc. of a 1 per cent. solution of citric acid, the solution filtered, 10 cc. of ammonium oxalate test solution added, the mixture warmed on the water bath for half an hour, allowed to stand for 24 hours, the precipitate of calcium oxalate collected, heated to low redness, cooled, the residue of calcium carbonate moistened with ammonium carbonate test solution, dried, again heated, and weighed.

In general the results obtained were slightly higher than those by the oxidation-

* The initials at the heads of the several columns correspond to the products sold by the following firms:
M. C. W.—Mallinckrodt Chemical Works.
P. W. R.—The Powers-Weightman-Rosengarten Co.
Schering—Schering & Glatz.
Squibb—E. R. Squibb & Sons.
Merck & Co.

† For the most part the acidity appears to be due to citric acid.

precipitation method. The determination of the amount of loss sustained by the salt when dried over sulphuric acid gave results that appeared to be of but little value in determining either the composition or the quality of the product. This test was evidently prescribed with the view of limiting the amount of adherent moisture rather than water of hydration. There is considerable confusion in the literature concerning the temperature at which the salt becomes anhydrous. Petit and Polonovsky, as noted earlier in this paper, prescribed a limit for loss on drying at 130° C., these chemists evidently believing that all of the water is driven off at that temperature. Astruc has reported that a temperature of from 150° C. to 160° C. is necessary for the determination of the water. The French Codex states that the salt becomes anhydrous at about 120° C. *but directs that the product shall be dried at* 150° *C. before analysis.* Hager (Handbuch Pharm. Prax., I, 96) states that the salt loses its water of hydration at 130° C. Concerning this we have made a few preliminary tests upon specimens containing little or no citric acid. These indicated that, after drying to constant weight at 130° C., no further loss took place if the temperature were raised at 150° C. As a drying temperature of 130° C. is thought by several of the authorities to be sufficient to drive off all the water of hydration and, as our preliminary tests appeared to confirm the belief, we chose that temperature and dried all of the specimens examined accordingly.

As the calcium content of the several specimens varied considerably it seemed worth while to determine the phosphorous also. This was carried out as follows:

From 0.3 gm. to 0.5 gm. of calcium glycerophosphate is weighed into a Kjeldahl flask, 10 cc. of a mixture of equal parts of nitric acid and sulphuric acid added, the mixture heated until oxidation is complete, a little more of the acid mixture being added with continued heating if necessary, the solution diluted with 50 cc. of water, 5 gm. of ammonium nitrate added, the mixture warmed, shaken and allowed to stand on the water bath until precipitation is complete, followed by 150 cc. of ammonium molybdate test solution, the precipitate dissolved in a slight excess of ammonia water, the solution filtered, 10 cc. of magnesia mixture test solution added, the mixture stirred, allowed to stand for 12 hours, the precipitate collected in a tared Gooch crucible, washed with 1 per cent. ammonia water, dried, heated to low redness for 15 minutes, cooled and weighed.

The results for calcium by the second method, for loss on drying at 130° C., and for phosphorus are given in the appended table:

TABLE II

Brand	M. C. W.	P. W. R.	Schering	Squibb	Merck
Water (Loss at 130° C.)	8.94	9.17	10.72	10.73	9.92
Calcium	12.84	15.83	15.65	15.21	14.95
Phosphorus	13.42	12.05	11.73	11.38	11.40

Pure calcium glycerophosphate, $Ca(C_3H_7O_6P.H_2O)$, should be soluble in water, should have a faintly alkaline reaction and should be practically free from chlorides, sulphates and alcohol-soluble matter. It should contain about 17.5 per cent of calcium and 13.6 per cent of phosphorus, and should yield about 55.7 per cent of ash on ignition. The results of the analysis show that none of the specimens examined were completely soluble in water. Those which were most nearly completely soluble were such as contained considerable quantities of an organic acid. The loss at 130° C. ranged from 8.9 per cent to 10.7 per cent, the theoretical loss for a salt containing 1 molecule of water of hydration being 7.9 per cent. Two specimens contained considerable amounts of chloride and four of them

contained considerable quantities of sulphate. One specimen (Powers-Weightman-Rosengarten brand) contained both chloride and sulphate. The alcohol-soluble material ranged from 9.66 per cent to nearly 7.5 per cent, the greater part of it, apparently being citric acid. The calcium content ranged from 12.6 per cent to 15.8 per cent, phosphorus from 11.4 per cent to 12.1 per cent, and the residue on ignition from 47.7 per cent to 51.9 per cent. The Mallinckrodt specimen contained considerable sodium. Since the calcium content of this specimen is considerably below the theory for calcium glycerophosphate and the phosphorus content is about normal for that salt, it appears probable that sodium glycerophosphate is present. In short, all of the specimens varied decidedly in one or more particulars. On comparing the results found in the examination with the standards prescribed in the foreign pharmacopœias and pharmaceutical commentaries it was found that none of the specimens examined complied with all of the requirements in any one of these authorities.

Concerning the tests suggested by us the several firms replied in general that the requirements were considered to be too stringent. Some believed that the standards extant in the foreign pharmacopœias and pharmaceutical commentaries were sufficient although, as we have already stated, our analyses had shown that none of the specimens examined complied with all of the requirements in any one of those authorities. Others stated that it was difficult to formulate standards of purity and strength for the substances because of the lack of uniformity in the commercial products. Still others thought that since the salt probably is to be described in the next revision of the U. S. Pharmacopœia, it was scarcely worth while to improve the product at this time.

From the Laboratory of the American Medical Association.

Nature is very un-American. Nature never hurries. Every phase of her working shows plan, calmness, reliability, and the absence of hurry. Hurry always implies lack of definite method, confusion, impatience of slow growth. The Tower of Babel, the world's first skyscraper, was a failure because of hurry. The workers mistook their arrogant ambition for inspiration. They had too many builders,—and no architect. They thought to make up the lack of a head by a superfluity of hands. This is a characteristic of hurry. It seeks ever to make energy a substitute for a clearly defined plan,—the result is ever as hopeless as trying to transform a hobby-horse into a real steed by brisk riding.—*William George Jordan.*

Reports of A. Ph. A. Committees

THE PROGRESS OF PHARMACY.

Submitting herewith the *first installment* of Abstracts from the Report on the Progress of Pharmacy during the year 1912, it becomes necessary to explain that all references to the reports prior to the report 1911, which is now in the printer's hands, will, as heretofore, be indicated by the word "Proceedings" (1910, 1909, etc), while the references to the reports published since 1910 will be indicated by the word "Report" (1911, 1912, etc.) Similarly, references to the Journal of the Association will be indicated by the word "Journal" (Jan., Feb., March, 1912, etc.) References to the Yearbook of the Association, however, if not part of the "Report," will be indicated by the abbreviated title "Yearbook A. Ph. A."

C. LEWIS DIEHL, *Reporter.*

Ambrette Seed Oils Properties and Constants.—It is well known that the normal distillate of ambrette seed is of a wax-like consistency, due to the large proportion of highly molecular fatty acids which it contains (principally palmitic acid), and that the liquid oil, from which all odorless admixtures is removed, is obtainable only by special treatment.

Schimmel and Co. have determined the constants in both of these:

Normal, Solid Distillate: Sp. gr. at 40°, 0.891 to 0.892; acid val., 75 to 123; ester val., 66 to 113; solid pt., 38° to 39°; insoluble in 10 vol. of 90% alcohol.

Liquid Oil: Sp. gr. at 15°, 0.9088 to 0.9123; opt. rot. 0°14′ to 1°19′; refr. index., 1.47421 to 1.47646; acid val., 0 to 2.4; ester val., 167.7 to 180.5; soluble in 3 to 6 vols. and more of 80% alcohol.—Schimmel's Rep., April, 1912, 25.

Ananas Sativa: *Analysis of the Fruit and Plant.*—E. V. Flack, Government Analyst, has subjected pineapples and the plant grown in the Bathurst District of the Cape Colony, to proximate analysis, with the following results:

	Fresh Fruit	*Fresh Plant*
Moisture	83.86%	81.45%
Crude Fat	1.11%	0.47%
Proteins	0.49%	0.75%
Crude Fibre	0.33%	3.25%
Nitrogen-free Extract	13.51%	12.02%
Ash	0.70%	2.06%
Silica	0.069%	1.12%
Lime	0.047%	0.121%
Potash	0.358%	0.356%
Phosphoric Oxide	0.024%	0.029%

The pines were grown in a sandy loam overlying gravel.—Chem. News, March 1, 1912, 99.

Benzaldehyde: Detection of Chlorine.—Dr. G. Heyl points out some of the defects of the G. P. V. process for the detection of chlorine in benzaldehyde, which are not removed completely even by the various modifications that have been suggested by Herzog and others. He therefore suggests the so-called "lime method" for the detection of the halogen, which has proven reliable when carried out as follows: About 1 or 2 gm. of calcium hydroxide (which, of course, must be free from Cl, and is so obtainable) is placed into a porcelain crucible, 10 to 15 drops of the benzaldehyde are added, and thoroughly incorporated with the hydroxide by means of a glass rod. The mixture is covered with a thin layer of calcium hydroxide, and is then carefully heated in the open flame, finally to redness. After cooling, the contents of the crucible are transferred to a beaker, 5-6 cc. of water carefully added, followed by nitric acid in faint excess, and the solution is filtered through chlorine-free filter paper (or glass wool). In the presence of chlorine, turbidity, greater or less according to the quantity, is produced on the addition of silver nitrate solution. By this method the presence of chlorine is sharply determined in a mixture of 1 drop of benzol non-chloride with 50 gm. of pure benzaldehyde.—Apoth. Ztg. XXVII (1912, No. 6, 49-50.

Benzaldehyde: *A Convenient Method of Detecting Chlorine.*—Referring to the above method proposed by Dr. Heyl, which doubtless yields reliable results, Prof. E. Rupp recommends the following simple method, which depends upon the fact that substances containing chlorine, when burned upon a surface of cupric oxide, produce cupric chloride, the smallest traces of which imparts a green color to a non-luminous flame. To carry out the reaction a section of copper wire or, better, a strip of copper netting about 0.5 cm. wide (with 1 mm. meshes), is rolled closely-spirally at one end so as to form a roll about the thickness of a pea. This is drawn several times through a non-luminous gas-, benzin- or alcohol flame, so as to form a surface of cupric oxide, and until all yellow or green color (due to NaCl) disappears. The reagent thus produced, after cooling somewhat, is simply dipped into the flame and, after allowing the benzaldehyde to burn up completely out of the flame, it is introduced into the non-luminous part of the same. If this now shows green luminosity, chlorine is present in the sample, the duration and intensity depending proportionally to the amount of chlorine present and the quantity of benzaldehyde adhering to the spiral, which was experimentally found to be about 0.3 gm. in a wire-net spiral, or 0.1 gm. in a wire spiral of the dimensions indicated. —Apoth. Ztg. XXVII (1912), No. 10, 92.

Copaiba: *Estimation of B-Caryophyllene as a Test for Adulteration.*—By acting on B-Caryophyllene with nitrogen tetroxide (NO_2), a crystalline nitro-derivative of caryophyllene, $C_{12}H_{19}N_3O_6$, melting at 159.5°-160°, is obtained. This compound is found very useful for the detection and estimation of B-Caryophyllene in volatile oils, by Deussen and Eger, who have applied it to the examination of the following oils:

(1) Caryophyllene from clove oil, (2) Para copaiba oil, (3) Maracaibo oil, and (4) mixtures of Para copaiba oil with gurjun oil and African copaiba oil. Three grammes of the oil is dissolved in 25 cc. of absolute ether and treated with nitrogen oxide. As soon as the separated nitro-compound begins to agglomerate at the bottom of the vessel, the reaction is stopped, and the precipitate filtered off, washed with ether, dried on a porous tile, and weighed. The direction in which this reaction may eventually be of considerable value is shown by the following figures, giving the amount of crystalline nitro-compound obtained:

Oil	*Nitro-Compound*
1. Caryophyllene (from stem oil)	yielded 50-52%
2. Caryophyllene (from bud oil)	yielded 50%
3. Para copabia oil (rotation—11.75°)	yielded 9.5-10%
4. Para copaiba oil (rotation—14.5°)	yielded 15%
5. Para copaiba oil (rotation—10.25°)	yielded 15%
6. Para copaiba oil (rotation—19.40°)	yielded 15-16%
7. Maracaibo copaiba oil (rotation—3.9°)	yielded 5-6%
8. Maracaibo copaiba oil (rotation—10.20°)	yielded 3%
9. Maturin copaiba oil (rotation—10.30°)	yielded 8-9%
10. No. 6 with 10% gurjun	yielded 13.3-14.3%
11. No. 6 with 20% gurjun	yielded 11.7-11.7%
12. No. 6 with 30% gurjun	yielded 10.7-11.7%
13. No. 6 with 50% gurjun	yielded 7.7- 8.7%

The authors recommend Turner's reaction for the detection of gurjun balsam in copaiba. This consists in dissolving 3 drops of the sample in 3 cc. of acetic acid with 2 drops of a freshly prepared 10 per cent. solution of sodium nitrite, then pouring the liquid onto a layer of concentrated sulphuric acid. Within half an hour a deep violet color develops in the acetic-acid solution if gurjun balsam be present.

The authors also recommend and describe a reliable method for the detection of African copabia, which is based on the difference in the melting points of the dihydrochloride of B-caryophyllene (60°-70°) and of the dihydrochloride of cardiene (117°-118°), produced by the action of gaseous HCl on the solution of the oil in absolute ether. In pure Para copaiba oil, the first mentioned is principally present, whereas in African oil cardiene dihydrochloride largely predominates. Chem. and Drug, May 25, 1912, 779; from Chem. Ztg., 1912, 561.

Kava Resin: *Estimation in Admixtures with Sandal Oil.*—The resin of kava roots has during recent years been frequently employed as an antigonnorrhoicum in combination with sandalwood oil, such combinations being usually exploited as trade-named specialties. Having frequent occasion to determine the resin content in such mixtures, Dr. Aufrecht has experimented with the object of finding a reliable method for its

estimation, the only published method being one given in the 1911 report of J. D. Riedel, by an unnamed author, which is based upon the sparing solubility of the resin in petroleum ether. Preliminarily, Dr. Aufrecht prepared an alcoholic extract, and from this by extraction with ether the crude resin, amounting to 5.70 per cent. of the kava root employed when competely dry. This crude resin had the following composition Soluble in petroleum ether, 5.05 per cent.; resin, (insoluble in petroleum ether), 91.5 per cent; extractive substances, 3.39 per cent.; ash, 0.06 per cent.; volatile oil, traces. After trying the method proposed in Riedel's Report, and finding it unreliable, the author eventually devised a method which he recommends as reliable. This consists in saponifying the mixture of kava-resin and sandal oil with alcoholic potash, heating on a water bath to remove the alcohol completely, dissolving the saponified mixture in boiling water, transferring the solution and rinsings into a flask, acidifying it with dilute H_2SO_4, and distilling until the distillate passes perfectly clear. The residual acid-resins in the flask, representing both the free resin and the esterified resin, are then collected on a tarred filter, washed, and dried to constant weight. In the experiments recorded, the method is found to be correct within 1.51 per cent., as an average of three determinations.—Pharm. Ztg., LVII (1912), No. 10, 92-93.

Methyl Alcohol: Detection in Alcoholic Preparations.—A. Hellriegel, after discussing various methods for the detection of methyl alcohol in ethyl alcohol and its preparations, recommends the following simple method as being particularly suitable for the use of pharmacists. The preparation is subjected to distillation and the distillate is fractionated, the portion distilling at 64° to 67° containing the methyl alcohol. This fraction is then boiled for three hours, under a reflux condenser, with one-half its weight of quicklime, whereby the greater part of water that may be contained in it combines with the lime. The condenser is then reversed and the distillate collected in a dry flask, whereupon the boiling point of the fraction is determined. Pure oxalic acid, dried at 100°, is now dissolved in the distillate, and the solution is boiled about one hour, when upon cooling, oxalicaciddimethylester crystallizes out. The crystals are collected on a suction filter and their melting point, which should be 54°, is determined. The corresponding diethylester being a liquid, the methyl alcohol is thus characteristically differentiated from ethylalcohol.—Pharm. Ztg. LVII (1912), No. 1, 7.

Methyl Alcohol: Detection in Ethyl Alcohol.—Referring to the above method for the detection of methyl alcohol in alcoholic preparations proposed by Hellriegel, C. F. Reichhardt suggests an equally simple, reliable method, which depends on a color reaction produced by means of oxalic acid and sodium alizarinsulphonate on the respective alcohols, provided that the distillate contains not less than 90 per cent. of ethyl alcohol. The test is carried out as follows: To 2.5 cc. of the distillate, 1 cc. of NaOH (G. P. solution) is added, followed by 3 drops of a 1 per cent. solution of sodium alizarinsulphonate, and the test-tube is rotated until a *clear, blue-violet* mixture results. Then 0.3 to 0.35 gm. of dry oxalic acid is added, and the mixture vigorously shaken several times. If alcohol is present, the color remains unchanged; but in the presence of methylalcohol a dirty-violet colored precipitate, of gelatinous consistence, forms on the walls of the test-tube, changing to a yellow color in the course of a few hours.

Another equally effective method is proposed by Dr. Aufrecht, who refers also to that proposed by Hellriegel. This method is based on the observation of A. Trillat that when methylalcohol is oxidized with potassium dischromate and sulphuric acid, methylal (CH_2 OCH_3 OCH_3) is formed, and this, when heated with dimethylaniline, yields "tetramethyldiamidodiphenylmethane," which by oxidation, even in great dilutions, develops a magnificent blue color, becoming more intense on heating, while the blue color produced with ethylalcohol under the same conditions disappears rapidly on heating.—Pharm. Ztg. LVII (1912), No. 4, 32.

New Pill-Excipient: Practically Universal Utility for Massing.—P. B. Phillips discusses the difficulties in deciding upon the proper excipient to use in making pill-masses, and gives a number of examples. He has found, however, that the nearest approach to a universal excipient is obtained according to the following formula and directions:

Gelatini	℈ ii
Glycerini	ʒ ii
Pulv. sacchari	ʒ iii
Aq. dest. ad	℥ i

Place the gelatin in a tarred evaporating dish with about ½ ounce of distilled water, and allow to stand for some minutes. Next add the glycerin, heat the mixture until the gelatin is dissolved. Then add the sugar in powder and continue the heating until the product weighs 480 grains. Transfer the contents to a covered pot, and stir until cool. As the liquid begins to set to a solid, stir briskly with a spatula in such a way as to work a certain amount of air into the product. This serves the double purpose of making the preparation whiter and softer. The author has given the name "Massol" to this new excipient, which keeps well and needs no preservative.—Chem. & Drugg. April 6, 1912, 53.

Nor-Hyoscyamine and Nor-Atropine New Solanaceous Alkaloids.—F. H. Carr and W. C. Reynolds announce the discovery of two new alkaloids obtainable from solanaceous plants, namely, nor-hyoscyamine and nor-atropine, which have hitherto eluded researchers, but the chemical identity of which is established by ample proofs of their constitution.

Nor-hyoscyamine ($C_{16}H_{21}NO_3$) differs from hyoscyamine ($C_{17}H_{23}NO_3$) only in that the methyl group, CH_3, is replaced by an atom of hydrogen. It was first isolated from *Scopolia jajonica,* but has since been obtained from *Datura Metel, Datura Meteloides,* and *Duboisia myoporoides.* It also occurs in *Datura fastuosa* and *Mandragora vernalis,* and probably in other solanaceous plants. Nor-hyoscyamine is crystalline, melts at 140° C., and forms well crystallized salts. Its specific rotation is -23°, while that of the basic ion contained in its salts is -33.8°. The ratio between these two figures is 1:1.47, which agrees with that of hyoscyamine. As regards

Nor-atropine, just as hyoscyamine is converted by the action of alkalies to its racemic modification atropine, so by the same treatment nor-hyoscyamine is converted into its racemic modification nor-atropine. Nor-atropine melts at 113° C., and forms a hydrate melting at 73. By the action of methyl iodide upon it atropine was synthetized, thus proving its relationship to the latter. Subjected to physiological tests, by Dr. Laidlaw of the Wellcome Research Laboratories, the two new alkaloids were found to have about one-eighth the mydriatic effect of the corresponding hyoscyamine and of atropine respectively. Finally, it may be metionned that the

Pseudo-hyoscyamine, isolated by E. Merck from *Duboisia myoporoides,* is considered by the authors to be nor-hyoscyamine contaminated with a little hyoscyamine.—Chem. and Drug., May 11, 1912, 700.

Oil of Aframomum Angustifolium: A New Volatile Oil.—Schimmel & Co. have distilled from the seed of a species of cardamom indigenous in German East Africa, received from Usambara, a volatile oil in a yield of 4.5%, which proved to be similar in every respect with the oil obtained from Cameroon-cardamoms, derived from *Aframomum Danielli,* K. Schumann, while the cardamoms now under consideration are identified by Schumann as a distinct species, namely, *Aframomum Angustifolium,* K. Schum. (N. O. Zingiberaceæ). The new oil was colorless; sp. gr. at 15°, 0.9017; opt. rot., -16°50′; refract. index, 1.46911; acid v., 0.4; ester val., 4.2; soluble in 6 vols. and more of 80% alcohol. Its aroma, however, cannot be compared with that of Ceylon cardamom oil, and owing to its high cineol content it reminds rather of cajaput oil. The quantity of oil at disposal was unfortunately too small to estimate its constitution with any exactitude.—Schimmel's Rep., April, 1912, 136.

Physostigmine: Derivatives.—It has been shown by Ehrenberg that when physostigmine is heated with alkalies in the absence of air, a new base is formed in addition to carbon dioxide and methylamine. This new base, designated—

Eseroline, has been the subject of investigation by Dr. A. H. Salway in order to gain further information regarding the constitution of physostigmine. Eseroline was found to be a mono-acidic tertiary base, which contains one nitrogen atom attached to a methyl group. It yields a hydrochloride, $C_{12}H_{16}ON_2$ .HCl, melting at 212° C., and a picrate melting at 195° C. The oxidation products of eseroline are:

Rubreserine, $C_{12}H_{12}O_2N_2$, a fine, deep-red crystalline compound, formed when eseroline was allowed to absorb two atoms of oxygen in the presence of alkali. It is a neutral substance, which, however, yield salts with both acids and bases. The hydrochloride, aurichloride, picrate, and silver salt of rubreserine were described.

Coeruleserine—the so-called "eserine blue"

—obtained by the slow oxidation of physostigmine, was isolated for the first time in a pure condition, and designated coeruleserine. It dissolves in water, giving, even in dilute solutions, an intensely blue color Acid solutions of coeruleserine are dichroic, being blue by transmitted light and carmine-red by reflected light. Coeruleserine has the formula $C_{11}H_{28}O_2N_3$, and yields salts with two equivalents of acid. Its formation is undoubtedly due to condensation of the degradation products of the alkaloid.—Chem. and Drug., May 11, 1912, 700.

Storax: Modification of Assay Process for Cinnamic Acid Content.—Referring to a recent article in "Perfumery and Essential Oils," in which, after drawing attention to the unsatisfactory quality of storax imported into England during the last decade, a process for the determination of the cinnamic acid content is given. C. A. Hill and T. T. Cockling suggest certain modification of this process for reasons explained, and record figures for recently imported storax, showing that while genuine storax of excellent quality can still be obtained, others that come to the market are little better than rubbish. The modified process adopted by the authors is as follows:

Saponify 2.5 grams of the prepared storax by boiling with 25 cc. of seminormal alcoholic potash and 20 cc. of alcohol for one hour under a reflux condenser; evaporate the alcohol and dissolve the saponified mass in 50 cc. of water.

Shake this aqueous solution with 20 cc. of ether, allow to stand, and separate the ethereal layer; wash the latter with 5 cc. of water, mix the washings with the aqueous solution, and reject the ethereal liquid.

Acidify the aqueous solution and extract the mixed cinnamic and resin acids by shaking out with ether four times. Transfer the ethereal solutions, after washing them with water, to a 200-cc. flask, and distill off the ether. To the residue add 100 cc. of water, connect the flask to the reflux condenser, and boil vigorously for fifteen minutes; pour off the hot liquid through a filter, allow to cool to 15°, and collect the crystals of cinnamic acid on a counterpoised filter. Repeat the extraction with the filtrate at least three times, or until no more cinnamic acid is obtained. Press the filter and crystals between blotting paper, and either dry *in vacuo* over sulphuric acid and weigh, or dissolve in alcohol and titrate with decinormal sodium hydroxide. To the result obtained add 0.03 grams for solubility of cinnamic acid in water.

Two samples from recent importations by the "British Drug Houses, Ltd.," showed: Acid val., 112.2 and 113.1; ester val., 91.3 and 92.8; sapon. val., 203.6 and 205.9; and contained 5.07% and less than 5% of cinnamic acid respectively. These were probably adulterated with resin as well as impoverished (by the abstraction of the odorous constituents); while five other samples from the same source (all of them separate consignments) gave the following constants, proving to be genuine storax: Acid val., 58.3-76.4; ester val., 118.2-145.9; sapon. val., 194.6 to 204.2, respectively. The cinnamic acid content was: 30.68%, 27.51%, 22.25%, 21.6%, and 26.64%.—Chem. and Drug., March 16, 1912, 412-413.

Unguentum Adhaesivam ("Klebesalbe"): *Useful Formula.*—Dr. Dreuw highly recommends the following formula for an adhesive salve, both on account of its composition and consistency, which he has found extremely useful for the treatment of all chronic infiltrations of the skin, whether of exzematic or psoriatic nature:

℞	Acid salicyl	10.0
	Pyrogallol	20.0
	Liqui. carbon. deterg.	20.0
	Zinc. oxydat	20.0
	Sapon virid	25.0
	Adip. lan. anhydric.	25.0

M. D. S. Ung. adhesiv.

The ointment has a white-grey color, but soon acquires a black color on the surface, while the interior retains its grey color. Its adhesive qualities, however, are remarkable, and superior to that of any other ointment. Consequently it adheres persistently to the skin, a desideratum particularly in the treatment of eczemas.—Pharm. Ztg., LVII (1912), No. 3, 27; from D. Med. Wsch.

Vanadium Compounds: Review, with Particular References to Their Therapeutic Use.—The numerous chemical investigations of vanadium and its compounds that are referred to in the "Report" of 1911 are not alone interesting from the chemical and technical standpoint, but are reflected also in the domain of medicine by the pharmacological investigations that have been made in recent

years in the search for vanadium compounds suitable for therapeutic exhibition. Dr. Felix von Oefele and Dr. J. Bullinger, in view of the prospective importance of the metal, its alloys, and saline compounds, have now contributed an interesting review of our present knowledge of these compounds, with particular reflection upon those which have found therapeutic use. They speak of the occurrence of vanadium in nature, mention some of the uses of its alloys in technical medicine—such for example as the gold and platinum alloys of vanadium in dentistry—and then proceed to the description of a number of inorganic compounds of the metal which have been favorably mentioned as therapeutic medicaments; such, for example, as the several different modifications of vanadium pentoxide (V_2O_5); the different salts of orthovanadic acid (H_3VO_4), vanadium dichloride, respectively, which are characterized by great stability, and have on this account been exploited for a number of years past as specialties under specific trade names. Other compounds that are promising are the iodides and oxyiodides of vanadium, vanadium trisulphide, and vanadium selenide. Interesting compounds also, although no pharmacological experiments have yet been made with them, are the vanadium sulphvanadates, the vanadium oxysulphvanadates, and the vanadium sulphates.—Pharm. Zeutralh., LIII (1912), No. 1, 1-9.

Volatile Oils: Effect of Hydrogen Dioxide on Flavor and Taste.—The chemist of E. Sachsse & Co. reports the results of a series of experiments which, in view of the energetic oxidizing action of hydrogen dioxide, were undertaken to determine the effect of the latter on the volatile oils containing easily oxidizable constituents—such as aldehydes, alcohols, etc., which frequently compose the aromatic flavors of mouth washes containing H_2O_2. The experiments were carried out by adding to a mixture of 40 gm. Alcohol (90 vol. percent), 30 gm. Water, and 25 gm. Hydrogen Dioxde, 0.05 gm. of the Volatile oil, and allowing this mixture to stand two months. The *taste* of the mixture was then compared with that of freshly-prepared mixture of identically the same material—no attempt being made to compare the *odor* by reason of the great dilution. The results were as follows:

Unchanged: Anethol, Anise Oil, Star-anise Oil, Bornyl-Acetate, Eucalyptol, Eucalyptus glob. Oil, Geranium Oil, Pine-needle Oil, and Thymol.

Changed: Taste fainter than fresh—Carvacrol, Eugenol, Clove Oil, and Terpineol; decidedly changed—Geraniol (insipid, musty odor), Menthol, Menthyl Acetate (taste completely destroyed), Peppermint Oils of all sort, and Cinnamic Aldehyde (completely oxidized, without a trace of cinnamon odor or taste).—Pharm. Ztg., LVII (1912), No. 4, 34.

Pharmaceutical Formulas

PROPOSED FOR A. PH. A. RECIPE BOOK.

(Continued from page 638.)

The present installment consists of formulas for Lotions, which the writer has been collecting for years. A great many of these preparations are frequently ordered on prescriptions, or called for over the counter, but the books at the disposal of the average pharmacist do not give formulas for same.

Strange to say, the pharmacopoeias and formularies of the Continent list none or very few lotions under the title "Lotio," but generally classify them as "Aqua" or "Liquor," or "Mixtura," or "Solutio," or "Spiritus," etc., as can be seen in Formula No. 1 (JOURNAL A. PH A., p. 169) for Kummerfeld's Lotion, which has the title of *Aqua* Cosmetica.

Comments and criticisms are invited.

Respectfully submitted,

OTTO RAUBENHEIMER, Chairman.

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Abbreviations can be found in May JOURNAL, p. 504.

Formulas No. 1 to 22, see February JOURNAL, p. 169 to 173.

Formulas No. 23 to 30, see April JOURNAL, p. 366 to 368.

Formulas No. 31 to 41, see May JOURNAL, p. 505 to 506.

Formulas No. 42 to 50, see June JOURNAL, p. 637 to 638.

LOTIONES.

Lotions.

The word "lotio" is derived from the Latin lavo=to wash.

Lotions are liquid preparations intended for application to the skin, or for use as washes for aural, nasal, ophthalmic, oral or urethral irrigation. They usually contain chemical substances in suspension or solution in aqueous vehicles. The addition of alcohol to aqueous lotions increases the rapidity of evaporation from the surface to which they are applied, their cooling effect being consequently increased. The use of glycerin in lotions retards the drying process and tends to produce a temporary protective film, which, if covered with a suitable dressing, remains moist for a considerable period.

Lotions are used without friction. They are applied with absorbent cotton, or upon linen or other absorbent fabric. Some lotions are allowed to dry on the skin and others are used so as to keep the area moist. In the latter case it is best to cover the moist cotton with oiled silk or some other waterproof material.

It should also be borne in mind that the ordinary lotions do not penetrate the epidermis.

<>

No. 51.

LOTIO ALBA.

White Lotion.
Lotio Sulphurata.

Zinc Sulphate	5 gm.
Sulphurated Potassa	5 gm.
Water, or Rose Water, a sufficient quantity	
To make	125 cc.

Dissolve each chemical in 60 cc. of Water, or Rose Water, which is preferred by some dermatologists and also by some patients on account of its odor; filter each solution and mix by slowly pouring the Potassa solution into the Zinc solution. Then add sufficient Water or Rose Water to make 125 cc.

It is absolutely necessary that the sulphurated potassa or liver of sulphur shall be fresh. When it has acquired a gray color and has lost its strong odor, then it is not fit for use.

This lotion should, of course, be dispensed with a "shake well" label.

The strength of White Lotion varies with some dermatologists from 4 to 8 gm. of each chemical to 125 cc.

<>

No. 52.

LOTIO ALBA COMPOSITA.

Compound White Lotion.

Precipitated Sulphur	5 gm.
White Lotion, a sufficient quantity	
To make	125 cc.

Mix well by trituration.
Shake well before using.

By experience, the writer has found that it is best not to have the bottle completely filled with this lotion, as there will be a gas generated which will cause the lotion to splash or the bottle to burst. The writer is therefor in the habit of using a 6-ounce bottle for 4 ounces of the lotion, and gives this advice to his fellow-pharmacists.

As in No. 51, dermatologists vary the strength of this lotion from 4 to 8 gm. of precipitated sulphur, as well as zinc sulphate and sulphurated potassa in 125 cc.

<>

No. 53.

LOTIO RUBRA.

Red Lotion.
Red Wash.

Zinc Sulphate	5 gm.
Compound Tincture of Lavender	60 cc.
Water, a sufficient quantity	
To make	1000 cc.

Dissolve the Zinc Sulphate in the Water and add the Compound Tincture of Lavender.
Shake well before using.

<>

No. 54.

LOTIO ALKALINA.

Alkaline Lotion.
P. B. Cx.

Sodium Bicarbonate Borax ..... of each	10 gm.
Distilled Water, a sufficient quantity	
To make	1000 cc.

Dissolve.
B. P. Cx. 1911.

No. 55.

LOTIO BENZOINI.

Benzoin Lotion.

Lait Virginal.

B. P. Cx.

Tincture of Benzoin	2.5 cc.
Rose Water, a sufficient quantity	
To make	100 cc.

According to the experience of the writer, the nicest and smoothest "Milk" is obtained by placing the tincture of benzoin into a perfectly dry bottle and in a thin stream add the water.

<>

LOTIO CALAMINÆ.

Calamine Lotion.

The composition of "Calamine Lotion" differs very much in its ingredients as well as in strength.

The two formulas selected are from authorities, namely, one from Dr. L. Duncan Bulkley, the well-known New York dermatologist, and used in the N. Y. Skin and Cancer Hospital, etc., and the other from the British Pharmaceutial Codex, 1911.

Inasmuch as the calamine of commerce frequently contains coarse particles, it is absolutely necessary to elutriate the calamine and zinc oxide by triturating in a mortar with successive portions of the liquids, water, rose water and lime water, and then decanting from the coarse or siliceous particles in the bottom of the mortar.

A

Calamine	4 gm.
Zinc Oxide	8 gm.
Glycerin	12 gm.
Lime Water	15 cc.
Water or Rose Water, a sufficient quantity	
To make	125 cc.

Dr. L. Duncan Bulkley.

B

Prepared Calamine	10 gm.
Zinc Oxide	5 gm.
Glycerin	5 cc.
Rose Water, a sufficient quantity	
To make	100 cc.

B. P. Cx.

No. 57.

LOTIO CALAMINÆ COMPOSITA.

Compound Calamine Lotion.

Phenol, liquified	1 to 2 cc.
Calamine Lotion No. 56 A	100 cc.

Mix.

N. Y. Skin and Cancer Hospital.

<>

No. 58.

LOTIO A. B. C.

St. Thomas Hospital.

Lotio Acidi Carbolici et Boracis.

B. P. Cx.

Glycerite of Phenol, U. S. P.	10 cc.
Glycerin of Borax, B. P. (No. 59)	10 cc.
Distilled Water, a sufficient quantity	
To make	100 cc.

Mix.

This lotion, diluted with five to ten times its volume of water, is an excellent antiseptic gargle and mouth wash.

<>

No. 59.

GLYCERINUM BORACIS.

Glycerin of Borax.

B. P.

Borax, in powder	10 gm.
Glycerin	60 cc.

Triturate until solution is effected.

<>

No. 60.

LOTIO EVAPORANS.

Evaporating Lotion.

A

Alcohol	20 cc.
Distilled Water, a sufficient quantity	
To make	100 cc.

B. P. Cx.

B

Ammonium Chloride	15 gm.
Alcohol	60 cc.
Water, a sufficient quantity	
To make	360 cc.

Ph. Formulas.

No. 61.

LOTIO ZINCI OXIDI.

Zinc Oxide Lotion.

Zinc Oxide	20 gm.
Glycerin	10 gm.
Rose Water	70 gm.
To make	100 gm.

By the addition of about 0.1 gm. of brown iron oxide, the so-called iron subcarbonate, a flesh tinted preparation will be obtained.
Hager Erg. Bd.

<>

No. 62.

LOTIO MAGNESIÆ ET ZINCI.

Magnesia and Zinc Lotion.

Magnesium Carbonate Zinc Oxide....of each	4 gm.
Water, or Rose Water, a sufficient quantity	
To make	125 cc.

N. Y. Skin and Cancer Hospital.

<>

No. 63.

LOTIO REFRIGERANS.

Cooling Lotion.

(Sir A. Cooper.)

Potassium Nitrate Ammonium Chloride....of each	150 gm.
Water	500 cc.

Dissolve.
Ph. Formulas.

<>

No. 64.

LOTIO RESORCINOLI.

Resorcin Lotion.

A

Formula of Dr. George T. Elliot.

Resorcin	5 gm.
Diluted Alcohol	100 cc.

N. Y. Skin and Cancer Hospital.

B

Andeer's Lotion.

Resorcin	10 gm.
Distilled Water	100 cc.

B. P. Cx.

No. 65.

LOTIO PICIS CARBONIS.

Coal Tar Lotion.

Solution of Coal Tar	0.5 cc.
Distilled Water, a sufficient quantity	
To make	100 cc.

B. P. Cx.

NOTE: Solution of Coal Tar or Liquor Picis Carbonis, also known under the trade-marked name Liquor Carbonis Detergens, is proposed for admission into N. F. IV. (See also Proc. A. Ph. A., Vol. 57, p. 1031).

CAUTION: *Lotio Picis Carbonis* and *Emulsio Picis Carbonis*, the formula which follows, should not be confused!

<>

No. 66.

EMULSIO PICIS CARBONIS.

Emulsio Coaltaris, Codex.
Emulsion de Coaltar.
Emulsion of Coal Tar.

Coaltar Saponiné Le Beuf (Lux.)

Solution of Coal Tar	1 part
Distilled Water	4 parts

Mix.

This emulsion is diluted with about 10 parts of water for ordinary use.

<>

No. 67.

.. LOTIO PICIS CARBONIS.

Alkaline Coal Tar Lotion.

Solution of Coal Tar	0.5 cc.
Sodium Bicarbonate	1.25 cc.
Distilled Water, a sufficient quantity	
To make	100 cc.

Dissolve the Sodium Bicarbonate in the Water and add the Solution of Coal Tar.
B. P. Cx.

<>

No. 68.

LOTIO PRO ERYSIPELAS.

Erysipelas Lotion.

Chloral Hydrate	40 gm.
Spirit of Camphor, a sufficient quantity	
To make	125 cc.

N. Y. City Hospital.

No. 69.

LOTIO OPII ALKALINA.

Alkaline Opium Lotion.
"Fuller's" Lotion.

Sodium Carbonate, crystals	24	gm.
Tincture of Opium	30	cc.
Glycerin	60	cc.
Water	270	cc.

N. Y. City Hospital—Hospital Formulary.

<>

No. 70.

LOTIO PRO ALOPECIA.

Dandruff Lotion.

Mercuric Bichloride	0.4	gm.
Resorcinol Boric Acid ..... of each	20	gm.
Glycerin	15	cc.
Alcohol	125	cc.
Water, a sufficient quantity		
To make	250	cc.

To be used as wash for the scalp.
Bellevue Dispensary.

<>

No. 71.

LOTIO PRO MANIBUS.

Hand Lotion.

Citric Acid	0.6	gm.
Comp. Tincture of Lavender	12	cc.
Alcohol Water ..... of each	30	cc.
Glycerin, a sufficient quantity		
To make	125	cc.

Kings County Hospital.

<>

No. 72.

LOTIO BISMUTHI COMPOSITA.

Compound Bismuth Lotion.
(Startin.)

Bismuth Subnitrate Zinc Oxide ..... of each	15	gm.
Spirit of Camphor Glycerin ..... of each	15	cc.
Water, a sufficient quantity		
To make	600	cc.

Mix.

A soothing application for irritable skin in acne, etc.

Ph. Formulas.

No. 73.

LOTIO SULPHURIS.

Sulphur Lotion.

Precipitated Sulphur	6.85	gm.
Glycerin	3.10	cc.
Alcohol	12.5	cc.
Rose Water	40	cc.
Lime Water, a sufficient quantity		
To make	100	cc.

Triturate the Precipitated Sulphur with the Glycerin and some of the Rose Water to form to smooth paste, and then add the other liquids.

B. P. Cx.

<>

No. 74.

LOTIO PLUMBI ET SULPHURIS.

Lead and Sulphur Lotion.
"Sulphur Hair Restorer."

Lead Acetate, in powder	1.75	gm.
Precipitated Sulphur	3.50	gm.
Spirit of Rosemary	2.50	cc.
Glycerin	12.50	cc.
Rose Water, a sufficient quantity		
To make	100	cc.

Mix the Lead Acetate and Precipitated Sulphur intimately, triturate with the Glycerin, then add the Spirit of Rosemary, and sufficient Rose Water to make up the required volume.

B. P. Cx.

<>

No. 75.

LOTIO QUININÆ.

Quinine Lotion.
"Eau de Quinine."

Quinine Hydrochloride	0.11	gm.
Chloroform	0.52	cc.
Alcohol	20	cc.
Glycerin	1.56	cc.
Cologne Water	1.56	cc.
Spirit of Myrcia (U. S. P. 1890)	25	cc.
Tincture of Cudbear	3.12	cc.
Rose Water, a sufficient quantity		
To make	100	cc.

Dissolve the Quinine Hydrochloride in 40 cc. of Rose Water, add the other ingredients,

make up to the required volume with Rose Water and then filter through purified talc.

B. P. Cx.

<>

No. 76.

LOTIO RESORCINI COMPOSITA.

Spiritus Resorcini.
Spiritus Capillaris.

Resorcinol	2.5	gm.
Castor Oil	2.5	cc.
Cologne Water	20	cc.
Alcohol, a sufficient quantity		
To make	100	cc.

Dissolve.

B. P. Cx.

<>

No. 77.

LOTIO IRRITANS, GRANVILLE.

Granville's Counter-irritant, or Antidynous Lotions.

A—Mild.

Stronger Ammonia Water	30 cc.
Spirit of Rosemary	24 cc.
Spirit of Camphor	8 cc.

Mix.

B—Strong.

Stronger Ammonia Water	40 cc.
Spirit of Rosemary	16 cc.
Spirit of Camphor	8 cc.

Mix.

These preparations will blister in periods, varied from 2 to 10 minutes, by saturating a piece of linen folder 5 or 6 times over a coin, and pressing it upon the part. Over more extended surfaces, a similar method is adopted by protecting the solution from evaporation.

Parrish.

(To be continued.)

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BOSTON COMPLETES THE RECORD.

The familiar "Record Book," the large leather-bound volume in which attendants at the annual convention record their names, was opened at Boston, September 13, 1859. The last page was filled at Boston, at the 59th meeting, in 1911. Evidently Boston pharmacists do not begin anything they can't finish.

The new record book has just been completed by the bindery, and will be used for the first time at Denver, on August 19th.

<>

CONTRIBUTION TO THE HALLBERG FUND.

Ferd Eliel Wertheim, of Chicago, Ill., a nephew of the late Leo Eliel, has contributed $10.00 to the Hallberg Memorial in memory of Mr. Eliel.

This reminds us that Leo Eliel was one who always stood straight up in favor of professional pharmacy, and that he labored in behalf of the American Pharmaceutical Association for many years.

A fund dedicated to his memory, the income to be devoted to some purpose which Mr. Eliel would have approved, would be a very appropriate means of perpetuating his memory in the Association for which he had such high regard. Should Indiana pharmacists take steps to originate such a fund, they will find many in other states ready to contribute to it.

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PRIZE NOMINATIONS TO MEMBERSHIP.

The professors in a number of colleges of pharmacy have adopted the laudable practice of giving prizes consisting of a nomination to membership in the A. Ph. A., and the first year's dues of $5.00, for excellence in scholarship.

Among prizes of this kind recently granted are the following:

JOHN ARTHUR RILEY,
301 Livingston St., Brooklyn, New York., awarded by Prof. Charles H. LaWall, of the Philadelphia College of Pharmacy.

RUSSELL C. WILCOX,
Gary, Indiana.

RUFUS C. ARBAUGH,
Jasper, Arkansas.

M. LEE ALBERTS,
Valparaiso, Indiana.

The last three prizes were presented by Professors G. D. Timmons and A. M. Linton, of the Valparaiso School of Pharmacy.

The Editor would be pleased to receive information concerning similar prizes offered by others.

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OUT-OF-DOOR MEETINGS FOR A. PH. A. BRNCHES.

Two A. Ph. A. Branches seem to have discovered almost simultaneously the benefit of out-of-doors-meetings.

The St. Louis Branch held a special outdoor meeting on June 7, at the Missouri Botanical Garden, in St. Louis; and the City of Washington Branch held a similar meeting at the Arlington Experimental Farm, U. S. Department of Agriculture, on May 25, and under the direction of Dr. Rodney H. True, who has charge of the Drug Division of the Experimental Farm, studied the efforts of the Government in drug cultivation.

Both meetings were well attended, and so far as we can judge from the reports, were highly enjoyed by the members.

The Branches at Philadelphia and New York City are likewise favorably situated for

such excursions, and we hope to hear that they have held such meetings before the summer has passed. The Branches of some other cities may be less favorably situated as regards botanical gardens, but there are few which are not within reach of "woodsy" places suitable for picnicking and botanical study.

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TENNESSEE EDUCATIONAL LOAN FUND.

The Tennessee Pharmaceutical Association last year inaugurated something new in state association work by laying the foundation for an "Educational Loan Fund."

The fund is to be made up by an annual contribution of the Tennessee Association and donations from individuals. The executive officers of the association are to act as Trustees, and when a sufficient amount has been raised loans will be made from it to worthy young men, and we presume also to worthy young women, to enable them to ecure a college education in pharmacy.

The object is to be commended, and we trust that the example of the T. P. A. will be imitated by other pharmaceutical asociations.

The history of educational loan funds conducted by societies other than pharmaceutical indicates that young men who are ambitious enough and far-sighted enough to pursue a college education to completion almost invariably repay such loans, and as a consequence such a fund, if properly administered, should increase with age.

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THE A. M. A. POST-GRADUATE COURSE.

One of the many good things championed by the American Medical Association is a four years' post-graduate course of study for physicians, conducted through the medium of County Medical Societies.

The curriculum is set forth in four pamphlets of about 50 to 90 pages each, giving a program of subjects for weekly and monthly meetings, suggestions for study, and lists of reference books.

To what extent physicians avail themselves of this work the writer is unable to say, but it is impossible to read the curriculum of the post-graduate course without being convinced of the fact that the A. M. A. has inaugurated a work which possesses great possibilities for the improvement of the mass of medical practitioners.

That physicians generally seem to accept this work with serious consideration is an indication of how much more alert they are to the means of general improvement than pharmacists. One who is familiar with the difficulty of getting a collection of local pharmacists together for any purpose will appreciate this fact. Indeed it has been said more than once that the profession of medicine as a whole owes its superiority in rank to pharmacy, and the greater dignity in which it is held, to the faithfulness of physicians to their State and County Medical Societies.

The success of the A. Ph. A. Branches which have been organized long enough to show local druggists what can be done for their mutual improvement by a monthly coming together, and of a few independent pharmaceutical associations in several of the cities indicates the possibilities for a like program for pharmacists.

Here is an opportunity where each individual pharmacist can do something towards professional advancement, and every town and district where there is a sufficient number of members to do so should organize a branch and when organized should support it, either by attendance of themselves or by securing the attendance of their assistants. As a rule it is easier to find men who are able and willing to furnish a program than to obtain an audience to listen to it. Besides, many druggists who regard their own experience as humdrum and trivial, after attending a few such meetings will discover that they also possess information that would be of value to others.

The summer season is the time to plan programs and to get the members together for the winter campaign. Where no branch is in existence it can be organized and initiated by an out-of-doors meeting.

The Bulletin Board

ANNOUNCEMENT TO THE SCIENTIFIC SECTION.

All members of the American Pharmaceutical Association interested in the Scientific Section are respectfully requested to advise

any one of the officers of the Section at an early opportunity of the subject or subjects of any paper or papers that they contemplate presenting before the Section at the Annual Meeting of the Association August 19-24, at Denver, Col. Many of the active members of the Section are busy with Pharmacopœia work, and should be able to present interesting resumes of results determined to date. Others have undoubtedly carried out special lines of research, the results of which would be of much interest to many members in attendance at the meeting. Each and every member of the Association in a position to present papers before the Section is earnestly requested to prepare such paper or papers, and advise any member of the Committee of the title or titles at an early date.

COMMITTEE ON SCIENTIFIC PAPERS.
W. O. RICHTMANN, Chairman,
Satsuma Heights, Fla.

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SECTION ON PRACTICAL PHARMACY AND DISPENSING.

Indications at this early date all point to a most interesting convention at our forthcoming meeting in Denver. Much work has already been done with this end in view; much more still remains to be done if we are to excel the achievements of former years. While the aggregate of such work seems large, if each loyal member will but play his part—the contribution of a single article, essay, or paper on some subject pertaining to our profession—the final result will be most gratifying to the committee in charge, to the members in attendance, and to the larger audience of the American Pharmaceutical Association throughout the entire land.

The American Pharmaceutical Association has within its ranks hundreds of capable pharmacists who ought to undertake and assist in this unselfish work. The contributors to this Section in the past have always been eagerly sought for by the pharmaceutical press because of their great value to the practical every-day pharmacists. Contributors therefore derive the benefit of this publicity, while indirectly it adds to their personal prestige as pharmacists worthy of their calling.

It is earnestly hoped that we may receive many responses from new members this year, and the committee stands ready at all times to offer advice or suggestions for intended articles in this particular field. Let the response be quite general this year. Let each one do his part, however small, and let us all get better acquainted with the work when we convene at Denver in August.

Fraternally yours,
P. HENRY UTECH, Chairman.
J. LEON LASCOFF, Secretary.
Meadville, Pa., June 19, 1912.

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SECTION ON HISTORICAL PHARMACY.

Bulletin No. 2.

The Committee on Historical Pharmacy is not in position to offer boxes of Havanna cigars as prizes, like the Committee on Commercial Interests (vide JOURNAL A. PH. A., May, p. 509), but is nevertheless happy to report that a number of papers have already been contributed and many more have been promised.

The paper, "Some Pharmacists in New York City Three-Fourths of a Century Ago" (JOURNAL A. PH. A., April, p. 359), by Ewen McIntyre, the nestor of New York City pharmacists, should also stimulate others to record the history of some pharmacies in their respective cities or states. And the paper by Ernest C. Marshall, "The Early History of the Massachusetts College of Pharmacy" (J. A. Ph. A., January, p. 53), should tempt other colleges also to write up their history and have same published in the JOURNAL and preserved in the archives of the Association.

The committee beg to announce that Prof. Edward Kremers' innovation at the Boston convention will be followed by an illustrated historical lecture at the Friday evening meeting of the Section at Denver.

Besides papers, we also solicit letters, photos, books, etc., on historical subjects.

Sincerely yours,
OTTO RAUBENHEIMER, Chairman.
EDWARD KREMERS, Historian.
CASWELL A. MAYO, Secretary.

Brooklyn, N. Y., June 15, 1912.

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MR. BODEMANN'S VIEWS ON PARCELS POST AND OTHER THINGS.

Dear Mr. Editor—I understand that on the door of your sanctum in the twelfth story of a Columbus sky-scraper you have a card: "Contributions are solicited, and if they don't meet our approval the contributor will not

be fired out of the window." This gives me courage to whisper a dissent from your views, or from some of your views, on "Parcels-Post."

In the first place, I am not a prophet, but I am not blind, and I do firmly believe that Parcels-Post will come! Why? Because all other so-called civilized, and some of the not yet civilized ones have parcels-post. Your argument that it will crush out the small merchant by the mail-order houses is a lame one, very lame, because it proves just the contrary.

You describe the fearful inroads of the mail-order houses into the business of the small merchant in the country. My dear Editor, I do not take a back seat to your love and championship of the small community and its merchants, but if whole communities have been wiped off the map by the mail-order houses without Parcels-Post as a factor, then parcels-post with its rate so adjusted that our mutual friend the country merchant is protected against the mail-order houses of Philadelphia and Chicago—who could not share in the low rates of the so-called Zone Schedule of the Parcels-Post—and, if it be true, that Parcels-Post wll benefit the largest number of our citizens, and injure the small merchant, then, if your honor please, would not that be a knock-down argument *for* rather than against Parcels-Post?

Laws that benefit the few against the many are class legislation and have no place on the statute books of a democratic government.

I understand you are not a very sound sleeper, and I sincerely hope that my incendiary letter does not conjure up nightmare before your nocturnal vision. I would rather be sent to the correction house for disorderly digestion than express views which I don't hold.

Parcels-Post will come—will follow in the wake of civilization. All the romances of Fenimore Cooper could not prevent the "Last of the Mohicans" from being the last one, and incidentally with the last Indian in the wilderness gone, we have more bad Indians than ever.

The double-decker—the Pharisee and time-server, the Tartuffe, the Patriot for Revenue Only of the new era is as treacherous a Cherokee as the genuine redskin ever was.

But that belongs to another Parcel of a job lot of canned Essays on Modern Diseases.

THE CONTRACT PLAN.

Pardon my frankness, but if you had cut out all but the opening paragraph of your editorial on the Contract Plan it would have been a corker.

Of course, you would and could have given your readers a knock-me-down argument on organization, and on honesty.

Speaking shorthand, any plan,—the best not excepted—without organzation and without honesty is not worth a continental, and with honesty you need no plan; and any plan that cannot be carried out is moonshine, and you cannot weave leather out of moonshine.

I have discussed these several plans with jobbers and manufacturers and,—while they talk guardedly and wisely when talking for publication—when you get down to brass tacks there is none of the plans that can be carried out, even if the good will is there, unless you have honest, honorable men strongly organized.

Any Pharisee and monte card expert can shoot the best plan so full of holes that a scar-battered flag of the Iron Brigade looks like sound material beside it.

WANTED, A NEW PROPAGANDA.

There was a time in the history of our country when a lifelong Democrat came to the assistance of a Republican President with his matchless eloquence, and his words were like a flash of lightning from North to South, from East to West. The speaker was Douglass, the President was A. Lincoln, opponents in the political campaign of 1860, but not in the 20th century billingsgate style.

Said Douglass: "No longer are we either Republicans or Democrats, but either Patriots or Traitors." That, Mr. Editor, applies to Pharmacy at the present hour! Now that the doctrine of propaganda is preached from housetops and from convention platforms, the pharamcists of America must choose between patriots or traitors.

The man who preaches Propaganda and practices Quackery is a traitor to the cause of pharmacy "A house divided against itself cannot stand." You can not be fish in front and roast beef in the rear. If you want confidence from public and physician you must come into court with clean hands. At the risk of being adjudged a heretic I firmly believe and am not afraid to say that pharmacy needs a crusade for honesty, honor and

self-respect more than any other kind of propaganda, and on this platform, your crusade for better things in pharmacy must stand or fall!

If you succeed, as I sincerely hope and trust, you will be a new "Saveur de Societe" as they termed it in the time of Napoleon III; if you fail, you will have sacrificed your ease and comfort for the sake of a noble cause and will be crucified on the cross of quackery, dishonor and charlatanry.

The A. Ph. A., for over half a century the valiant standard bearer for clean, decent, honest pharmacy, should be the rallying ground for American Pharmacists, and if, like in the days of 1861, we could sing: "We are coming, father Beal, 50,000 strong," you would have an army that would sway everything before it!

There never was a breath of suspicion of quackery raised against this noble association, for which you wage warfare, and whether there is immediate return for the $5.00 dues in sight or not, it should be the duty of every self-respecting pharmacist loving his cause to join this army and contribute his mite, no matter how small and humble, to the victory of the future. If the cause of the A. Ph. A. does not conquer, pharmacy will be one of the lost arts! With the warriors of our militant N. A. R. D. fighting for a decent living, decent hours, decent rest, and the A. Ph. A. for decent pharmacy, I behold the dawn of a new morn. W. BODEMANN.

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U. S. PUBLIC HEALTH AND MARINE HOSPITAL SERVICE.

RECENT CHANGES IN PHARMACISTS' ASSIGNMENTS.

Brown, F. I., Pharmacist. Relieved from duty at the Marine Hospital, Chelsea, Mass., and directed to report to the medical officer in command at the Marine Hospital, Vineyard Haven, Mass., for duty and assignment to quarters. April 29, 1912.

Thurston, E. J., Pharmacist. Upon the arrival of Pharmacist O. C. Cannon, relieved from duty at the Marine Hospital, Chicago, Ill., and directed to report to the medical officer in command of the Marine Hospital, Evansville, Ind., for duty and assignment to quarters. April 29, 1912.

Troxler, R. F., Pharmacist. Upon the arrival of Pharmacist E. J. Thurston, relieved from duty at the Marine Hospital, Evansville, Ind., and directed to report to the medical officer in command of the Marine Hospital, San Francisco, Cal., for duty and assignment to quarters. April 29, 1912.

Cannon, C. C., Pharmacist. Upon the arrival of Pharmacist F. L. Brown, relieved from duty at the Marne Hospital ,Vineyard Haven, Mass., and directed to report to the medical officer in command of the Marine Hospital, Chicago, Ill., for duty and assignment to quarters. April 29, 1912.

Granted 20 days' leave of absence from May 10, 1912.

Bierman, C. H., Pharmacist. Upon arrival of Pharmacist J. L. Osborn, relieved from duty at Baltimore, Md., and directed to report to the medical officer in command, Marine Hospital, Portland, Me., for duty and assignment to quarters. May 17, 1912.

Osborn, J. L., Pharmacist. Relieved from duty at Fort Stanton, N. M., and directed to report to the medical officer in command, Marine Hospital, Baltimore, Md., for duty and assignment to quarters. May 17, 1912.

Granted five days' leave of absence enroute to station. May 17, 1912.

Pharmacist M. B. Eldridge resigned, effective May 27, 1912. May 21, 1912.

Irwin, C. H., Pharmacist. Upon arrival of Pharmacist Troxler, relieved from duty at San Francisco quarantine station and directed to report to the medical officer in command, Fort Stanton Sanatorium for duty and assignment to quarters. May 22, 1912.

Troxler, R. F., Pharmacist. Orders dated April 29, 1912, directing him to report to Marine Hospital, San Francisco, Cal., amended so as to direct him to report to the medical officer in command of the San Francisco Quarantine Station for duty and assignment to quarters. May 22, 1912.

Weitgenant, W. W., Pharmacist. Granted three months' leave of absence from June 1, 1912. May 27, 1912.

Pharmacist Julius E. Beck resigned, effective June 7, 1912.

State Associations

THE MISSOURI PHARMACEUTICAL ASSOCIATION.

The Mo. Ph. A. held its thirty-fourth annual meeting at Pertle Springs (Warrensburg), June 11-14. It was the eleventh meet-

ing place and the convention voted to meet again at the same place, the second Tuesday in June, 1913.

The register shows 70 members, 62 salesmen, 53 ladies and 3 children, a total of 188. Of those who attended the meeting twenty-five years ago, the following were present this year: J. M. Love, F. R. Dimmitt, Charles L. Wright, William Mittelbach, H. M. Whelpley and George L. Parsons. Of those who took part in the organization meeting in 1879, C. L. Clifford and F. R. Dimmitt were present in 1912. H. M. Whelpley completed his twentieth successive year as Secretary.

Ralph L. Wardin, Nevada, was unanimously nominated for reappointment as a member of the Board of Pharmacy. His term expires July 1.

Treasurer Mittelbach reported a cash balance of $283.53. Forty-four new members were elected. Seven deaths occurred during the past year.

The A. Ph. A. and the N. A. R. D. were represented by delegates and communications.

A resolution was adopted condemning the action of the Missouri Insurance Commissioner in placing a ban on Druggists' Liability Insurance.

Secretary Charles E. Zinn and President William Mittelbach reported for the Board of Pharmacy which has adopted practical examinations and now requires one year high-school work or its equivalent before taking an examination.

Ed. C. Fritsche, of Leavenworth, represented the Kansas Ph. A. in an interesting address.

Several of the papers were accompanied by demonstrations and illustrations and much time was devoted to practical discussions.

A committee was appointed on the Procter Monument Fund.

A report was made on the Beal Fund, the interest of which is used in paying the dues of the candidate for registration making the highest general average.

It was decided to discontinue giving medals for papers. Prizes were discarded several years ago.

Although Missouri was the first state to urge the attendance of women and children it does not have an auxiliary. Mrs. H. M. Whelpley directed this feature of the entertainment.

MO. PH. A. OFFICERS FOR 1911-12.

President, H. O. A. Huegel, St. Louis.

Honorary President, F. R. Dimmitt, Kansas City.

First Vice President, Jesse E. Koppenbrink, Higginsville.

Second Vice President, Ed. G. Schroers, St. Joseph.

Third Vice President, Dr. E. L. Rhodes, Lincoln.

Treasurer, William Mittelbach, Boonville.

Permanent Secretary, Dr. H. M. Whelpley, St. Louis.

Local Secretary, F. W. Robinson, Warrensburg.

COUNCIL.

I. Ben Miller, Cape Girardeau, Chairman.

Leo Suppan, St. Louis, Vice Chairman.

D. V. Whitney, Kansas City, Secretary.

Paul L. Hess, Kansas City, and J. A. Trimble, Butler.

THE PAPERS.

1. Castor Oil and Castor Bottle. By J. F. Llewellyn, Mexico, Mo.

2. Crushed Fruits. The Process of Manufacture and Sterilization Against Bacteria. Yeast and Molds. By O. J. Cloughly, St. Louis.

3. Is an Itinerant Association Successful? By Francis Hemm, St. Louis.

4. A Formula for Deodorized Tincture from Deodorized Opium. By Wm. K. Ilhardt, St. Louis.

5. A Poisoning Expert of the Seventeenth Century. By Leo Suppan, St. Louis.

6. The Missouri Pharmacy Law Compared with the Beal Model Law. By William Mittelbach, Boonville, Mo.

7. The Missouri Pharmaceutical Association 1887 Meeting. By Dr. H. M. Whelpley, St. Louis.

8. American Medicine. By J. F. Llewellyn, Mexico, Mo.

9. Analysis of the Missouri Pharmacy Law. By William Mittelbach, Boonville, Mo.

10. The Issues of the Day. By H. O. A. Huegel, St. Louis.

11. The Sale of Poisons. By William Mittelbach, Boonville, Mo.

12. Practical Suggestions. By O. J. Cloughley, St. Louis.

13. The Indian Doctor. By Dr. H. M Whelpley, St. Louis.

The Missouri Pharmaceutical Travelers' Association held its twenty-first annual meet-

ing and elected the following officers: Bob Grigor, President; Ed. Himburg, First Vice President; O. H. Oestereich, Second Vice President; V. H. Tisdale, Third Vice President; W. R. Adelsperger, Secretary; D. R. Dunavan, Assistant Secretary; Dan Liddy, Treasurer; Andrew E. Holmes, Publicity Representative; C. L. Chittenden, Sergeant-at-Arms.

Council: C. M. Coon (Chairman), Kansas City; Rex Hood, Kansas City; Charles Wagner, St. Louis; Otto P. Meyer, St. Louis. C. L. Chittenden, St. Louis, Charles Wagner, St. Louis, and Ed. Hunter, Kansas City, were appointed as a welcome committee, to cooperate with a similar committee from the Mo. Ph. A. The travelers raise the money for the entertainment, secure the prizes and have charge of the social features at the annual meeting. Wm. H. Lamont is Chairman of the committee.

H. M. WHELPLEY, Secretary.

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ILLINOIS PHARMACEUTICAL ASSOCIATION.

The most striking feature of the recent meeting of the Illinois Pharmaceutical Association at Springfield was the report of the Legislative Committee on the overwhelming vote in favor of the graduation prerequisite. The committee had sent a circular letter to all of the registered pharmacists of the state inviting them to vote upon this subject. Twelve hundred and twelve votes were received—965 in favor of the graduation requirement and 247 opposed, thus putting a quietus on the statement which has been made frequently, that the druggists of Illinois are opposed to the graduation prerequisite.

The Association also adopted resolutions on the death of Mr. Henry Biroth, who was President of the I. Ph. A. during 1881-82, local Secretary at the World's Fair meeting in 1893, and Honorary President of the A. Ph. A., 1912-1913.

The Convention was one of the most successful ever held by the Association. The attendance was large, the sessions harmonious and the entertainments delightful. Much credit for the success of the entertainments and the comfort of the visitors is due the Sangaman County Retail Druggist's Association, who with the Illinois Pharmaceutical Traveler's Association had charge of these features.

The reports of the financial officers showed that the Association is in prosperous condition. Fifty new members were elected at the meeting.

The officers elected are: President, J. H. Wells, Chicago; First Vice President, Ralph E. Dorland, Springfield; Second Vice President, J. A. Reiss, Rock Island; Third Vice President, Paul Grace, West Salem; Secretary, W. B. Day, Chicago; Treasurer, Chris Garver, Bloomington.

The next meeting will be held at Quincy.

W. B. DAY, Secretary.

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Matters of General Interest

RULES AND REGULATIONS OF THE FEDERATION INTERNATIONALE PHARMACEUTIQUE.

NAME AND WHERE ESTABLISHED.

Article 1. On the 5th September, 1910, the Tenth International Pharmaceutical Congress, held at Brussels, resolved at the proposal of "de Nederlandsche Maatschappij ter bevordering der Pharmacie" to the establishment of an International Union, formed out of the National Pharmaceutical Societies, Associations and Companies, and to be known as the "Federation Internationale Pharmaceutique."

The Federation will have its registered Office at the Hague.

OBJECT.

Article 2. The object of the Federation is the promotion of Pharmacy, either as profession or as applied science, along international channels.

Article 3. The Federation will endeavor to attain this object by:

1. Collecting data with regard to the pharmaceutical profession in all countries and by supplying information on scientific and practical pharmacy.

2. By promoting uniformity in the qualifications required for education and tuition.

3. By studying the laws regulating the pharmaceutical profession.

4. By giving advice and supplying data with regard to the laws relating to pharmacy.

5. By organizing international pharmaceutical congresses.

6. By filing the papers of these international congresses, arranging and working out the subjects treated there and studying fresh subjects for treatment.

7. By making arrangements for taking part in congresses of interest to pharmacy and by collaboration with other international societies.

8. By protecting the rights of the pharmaceutical profession.

9. By opposing the sale of secret remedies and the practice of pharmacy and sale of medicines by unqualified persons.

10. By promoting uniformity in the form of medicines and methods of investigation.

12. By promoting international ententes, regulating the drug-trade.

13. By exercising its influence in the event of an international regulation of patents, brands and trade-marks.

14. By the publication of papers on subjects of interest to international pharmaceutics.

15. By doing all other things as may be considered conducive to the attainment of the object of the Federation.

MEMBERS.

Article 4. The members of the Federation are divided into honorary members, ordinary members, corresponding members and associates.

Article 5. Honorary members are those who have done special service for and deserve well of the Federation. They are nominated by the Central Committee.

Article 6. Ordinary members are:

1. The Governments subsidizing the Federation. They are represented in the Central Committee by a voting member.

2. Those National Pharmaceutical Societies which are incorporated and may be regarded as representing the pharmaceutical profession in their country in the widest sense. They are represented in the Central Committee by voting delegates. The Central Committee decides as to the admission of the National Societies.

3. The President and General Secretary of the last held International Congress and those of the next.

Article 7. Corresponding members are nominated by the Central Committee in countries or colonies having no pharmaceutical association, which is a member of the Federation.

Article 8. Associates are those persons and societies who wish to promote the prosperity of the "Federation Internationale Pharmaceutique" and are nominated by the Central Committee.

They will receive the papers published by the Federation and may be present at the meetings but have no vote.

Article 9. All persons named in Articles 5, 6 and 7 form the Central Committee. Societies having less than 500 members may have one member as representative in the Central Committee, societies with from 500-1000 members two, those with from 1000-1500 three, 1500-2500 four, 2500-5000 six, and those with more than 5000 members eight.

A member of the Central Committee may transfer his right to vote to another delegate of his society.

ORGANIZATION.

Article 10. The Central Committee represents the Federation both at law and otherwise and appoints a Board consisting of: 1 President, 4 Vice Presidents, 1 General Secretary and 2 Assistant Secretaries.

This Board is entrusted with the carrying into effect of all resolutions of the Federation.

The Board has its office at the Hague and meets there. A Board meeting, however, may also be called elsewhere if deemed expedient by the President. The General Secretary must reside at the Hague, he is appointed for a period of six years and is re-eligible. The other members of the Board are elected by and from among the members of the Central Committee for a period of three years and are re-eligible.

The Board regulates its business by its own domestic rules.

Article 11. The President or one of the Vice Presidents presides the meetings and with the Secretary signs all outgoing documents. The President or one of the Vice Presidents must reside in Holland.

The General Secretary is entrusted with the files, the convening of meetings and the carrying into effect of the resolutions of the Board. In consultation with the Board he appoints a staff.

He manages all moneys belonging to the

Federation and, annually, has to give an account of his management to the Board.

The President enters into a written agreement with the General Secretary for the time he will be in office. This agreement must be valid according to Dutch law. The Board fixes the amount of his guarantee for the moneys under him.

REVENUE.

Article 12. The income of the Federation consists of:

1. Government subsides.

2. Fixed annual contributions of the national societies, members of the Federation. This contribution is fixed at fr 100.— for each delegate, the society has a right to appoint in the Central Committee in connection with the number of its members. This contribution may be notified by the Central Committee for each subsequent year.

The fixed contributions sub 2 are to be sent, by the members of the Central Committee representing the national societies before the 1st May of each year, by registered letter or P. O. O. to the General Secretary at the Hague.

3. Annual contributions of associates. This contribution is fixed at fr 20.— p. a.

4. Donations, voluntary contributions or bequests by societies or individuals.

SPECIAL COMMISSIONS.

Article 13. The Central Committee may appoint special commissions for special purposes and also invite persons, not being members of the Central Committee, to take part in the work and discussions of such commissions.

These special commissions will draw up a report to be submitted to the Board, while all papers are to be sent to the Secretary.

Article 14. The Central Committee may grant a fixed amount for the labors of these special commissions.

MEETINGS.

Article 15. The meetings are divided into:

1. Board meetings.

2. General meetings.

Board meetings are called by the President or when the request of three members of the Board.

The general meetings are called by the President or if deemed expedient by the Central Committee at a place to be fixed by the Board. Proposals to this effect should be submitted to the Board by registered letter. If necessary the Central Committee takes a decision in this regard by votes in writing.

All members of the Central Committee may attend these general meetings.

Resolutions at these meetings are carried by a majority of two-thirds of the votes polled.

Article 16. Instead of in a meeting, voting and treatment of subjects may also take place by registered letter.

Article 17. The Board of the Federation may lend its assistance for holding an International Congress after consulting the pharmaceutical societies in the country where the Congress is to be held.

Article 18. The organizing of these international congresses is entrusted to a National Committee; Presidents and General Secretary are appointed in consultation with the Board of the Federation.

The International Congresses are regulated by the Organizing National Committee in consultation with the Board of the Federation.

GENERAL STIPULATIONS.

Article 19. The Federation will not encroach upon the sphere of activity of the National Societies.

Article 20. Any proposal to alter these rules will have to be put forward by the Board or by the Central Committee.

Article 21. Any proposal to dissolve the Federation will have to come from the Board or from a majority of the members of the Central Committee. It can only be put to vote at a meeting convened at least three months previously by registered letter and at which at least one-half of the members of the Central Committee exercises the right to vote.

Voting members, who are prevented from attending this meeting may register their vote by registered letter. If one-half of the members is not either present or represented the proposal will be voted upon in writing. In the latter case the proposal must be agreed to with at least two-thirds of the votes registered.

Article 22. Societies, desiring to discontinue their membership, are to give at least one year's notice thereof.

Article 23. These rules and regulations will be construed according to the French text and the Dutch law.

Article 24. In case the Federation is dissolved all its possessions become the property of the State of the Netherlands.

THE INTERNATIONAL OPIUM CONFERENCE.

International action to control the traffic in opium, morphine, cocaine, and other drugs with like properties seems likely to result from the Opium Conference which has recently been sitting at The Hague. The initiative and influence of our own representatives have been particularly directed towards practical legislation to deal with the traffic in morphine and cocaine, and their efforts have met with very general sympathy and support. It is understood that the representatives of the twelve powers concerned are agreed that these drugs should not be allowed to be exported except without a permit, but the actual terms of the convention are not yet known. The object aimed at is, of course, to limit, as far as possible, the production of cocaine and morphine by the demand for *bona-fide* medicinal purposes. That a large proportion of the output of these alkaloids is put to illicit uses cannot be disputed, and any measure of legislation which appreciably curtails irregular traffic in these drugs must necessarily lead to a diminished production, and possibly to some alteration in price. The possible effect on the market for cocaine and morphine and their salts of the operation of such regulations as the conference may initiate must not be overlooked, but it will be better to await until the terms of such regulations are available before speculating as to what those effects may be.—*Pharmaceutical Journal* (London).

EXTRACTS FROM OLDFIELD BILL (H. B. 23417) TO AMEND THE PATENT LAW.

Section 17. * * * * * * *

If at any time during the term of the patent, except the first four years, the patented invention shall not be manufactured, or the patented process carried on within the United States, its Territories, or possesions aforesaid to an adequate extent by the owner thereof, or by those authorized by him, then *any person demanding it shall be entitled to a license from the owner of the patent* to manufacture the invention or to carry on the patented process, unless the owner shall show sufficient cause for such inaction.

Upon the refusal of such a license by the owner of the patent, the person seeking such license may apply to the district court, in the district wherein the owner has a residence or an established place of business, to compel the granting of such license. The court shall thereupon hear the person applying for said license and the owner of the patent, and, if the court is satisfied that the reasonable requirements of the public in reference to the invention have not been satisfied by reason of the neglect or the refusal of the patentee, his legal representatives, or those authorized by him to make, use, or vend the invention, or to grant licenses to others on reasonable terms to make, use, or vend the same, *said court shall issue an order requiring the owner of the patent to grant a license to the person applying therefor* in such form and upon such terms as to the duration of the license, the amount of royalties, security for payment, the period within which the patented invention shall be manufactured or the patented process carried on; and otherwise as the court, having regard to the nature of the invention and the circumstances of the case, deems just.

From the order of the district court granting or refusing to grant such a license, appeal may be taken (by the party aggrieved) to the circuit court of appeals in the same manner and form as in other cases arising under the patent laws: *Provided,* That the citizens of any country which by treaty, convention, or law provides that the manufacture of the patented invention or the carrying on of the patented process in the United States shall be equivalent to the manufacture or the carrying on of the process in such country will be considered to have sufficiently complied with the requirements of this section if the invention is manufactured in said country within the period heretofore mentioned.

If at any time during the life of a patent a material and substantial *improvement* shall be patented, the manufacture of which would be an infringement of the original patent, the owner of the improvement patent may apply to the district court in the district wherein the owner of the original patent has a resi-

dence or an established place of business to *compel the granting of such a license* as will enable the improvement to be manufactured.

The court shall thereupon hear the respective parties, and if the court is satisfied that the improvement is of such a material and substantial nature that the reasonable requirements of the public demand that it should be manufactured and sold, the court shall issue an order requiring the owner of the original patent to grant a license to the owner of the improvement patent in such form and upon such terms as to the duration of the license, the amount of royalties, security for payment, the period within which the patented invention shall be manufactured or the patented process carried on, and otherwise, as the court, having regard to the nature of the original invention and improvement and the circumstances of the case, deems just.

From the order of the district court granting or refusing such a license appeal may be taken by the party aggrieved to the circuit court of appeals in the same manner and form as in other cases arising under the patent laws.

Section 32 * * * * * * *

Any person who purchases of the owner of a patent, or of any interest therein, any machine, manufacture, or composition of matter covered by such patent, shall have the *unrestricted* right to use, vend, or lease to others to be used the specific thing so purchased without liability to action for infringement; and it shall not be lawful to insert a condition in any contract relating to the sale, lease, or license to use any article or process protected by a patent or patents, the effect of which will be to prohibit or restrict the purchaser, lessee, or licensee from using any article or class of articles, whether patented or not, or any patented process supplied or owned by any person other than the seller, lessor, or licensor or his nominees; and it shall not be lawful to insert a condition in any contract relating to the sale, lease, or license to use any article or process protected by a patent or patents, the effect of which will be to require the purchaser, lessee, or licensee to acquire from the seller, lessor, or licensor, or his nominees, any article or class of articles not protected by the patent, and any such condition shall be null and void as being in restraint of trade and contrary to public policy.

Obituaries and Memorials

Persons having information of the death of members of the A. Ph. A. are requested to send the same promptly to J. W. England, 415 N. 33d St., Philadelphia, Pa. Information as to the age, activities in pharmacy, family, etc., of the deceased should be as complete as possible. When convenient a cabinet photograph should accompany data.

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HENRY BIROTH.

Henry Biroth was born in Posen, on September 19, 1839, and came to the U. S. in 1857. He was apprenticed to Dr. Frederick Mahla, one of the leading apothecaries and chemists of the Northwest in early days; he enlisted in the army of the Civil War; started a store for himself on Archer Road and Halsted, and conducted the old Wahrlich Pharmacy on Kings and Clark with J. Blocki up to the big fire in '71, when he lost all he had but his honor, industry and credit. Soon after the fire he sprouted out on the South Side bigger than ever, went into the manufacturing of pharmaceutical products, and

about five years ago retired, and followed his refined taste for travelng, for art, music, nature, history and philosophic study.

He was Local Secretary of the A. Ph. A. for the World's Fair Meeting of '93; Honorary President of the A. Ph. A., 1911-12; was twice President of the Chicago College of Pharmacy; President of the Illinois Pharmaceutical Association, 1882-83; established the Biroth Prize for Microscopy at the Chicago College of Pharmacy, and received the degree of Master of Pharmacy from the University of Illinois. But more than all of this he was a noble character, a loving, lovable man, gentle and pure as a child, extremely modest, and never lost his temper; never caused nor loved unpleasantness, and always loved to patch up things and conciliate. More than once did he take me in hand, when I was enjoying a little difference of opinion with other pharmaceutical pugilists, now dead, and can not file a demurrer, and therefore no names are mentioned. He, smiling, patted us on the shoulder, told us we were both right and wrong and fools at that. I caved in, admitted that I was guilty, and did not cross-examine him in his evidence that the others were fools.

The two Chicago schools would have been merged, through Henry's arbitration methods, had it not been for the appearance of a fighting rooster in the finishing home stretch.

Teasingly I often referred to him in my C. V. D. A. duties as a multi-millionaire. Not lately! Henry came to me and smiled and begged me to drop this exaggeration of his wealth, and added: "I don't want to be valued by my friends for what I *have*, but for what I *am*," and who in this wide world could resist that man's smile and his request? Not I. And I cut out the multi altogether.

He left with me in obedience to my urgent request for an autobiography, a most memorable manuscript, a glimpse into his soul life, "Observations on Religion, Ethics, Tolerance, Immortality, and Fraternal Love." He himself was timid about its value; did not think it worth while printing before he submitted the manuscript to the critical review of those of his friends who would honor his truthful character by fearless judgment. Unnecessary to say the judgment was unanimous, "sublime, superb, and a wrong if not preserved." Had he returned to us as he intended, he would have no doubt consented to the printing (and we hope that this will be done yet). I re-read the manuscript since his death, and am awed at the beauty of the lofty philosophy of Henry's religion of Humanity.

Last but not least, Biroth was a charter member, and president in 1905 of the C. V. D. A., and an ardent, loyal adherent of this unique association. Had he lived he would have assisted President Jamieson in his praiseworthy effort to nationalize the Veterans' Association doctrine. He truly did his share to "Cheer the Living," and now that he is dead, he has our "Tears."

I for one, am not ashamed of tears for such a prince among men, the exalted and yet modest "Prince Henry," as his intimate friends addressed him.

If I analyze cause and effect correctly, I believe I can find the reason why I loved Henry as dearly as I did in the Law of Opposite Poles. My own makeup is about as different from what Biroth was as can be, but I bow my head to his superiority. He chose the better part, and I treasure his memory as dearly as any other of my mental possessions.

Biroth died in Baden Baden, on May 29, 1912. His daughter, Mrs. Massey, and her husband did not reach him in time.

W. BODEMANN.

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THOMAS DOLIBER.

Thomas Doliber, of Boston, a member of the class of 1869, the first graduating class of the Massachusetts College of Pharmacy, and for many years president of the Mellin's Food Company, died at New Bedford, Mass., on June 5, 1912, aged 76 years.

He, with S. M. Colcord, were partners with Theodore Metcalf, as the Theodore Metcalf & Co. of Boston. When the Mellin's Food Co. was established, Mr. Doliber became its president and remained such until his death.

He became a member of the Massachustts College of Pharmacy in 1867 and served it in various capacities, faithfully and loyally. He succeeded Samuel A. D. Sheppard as Trustee and Chairman of Invested Funds of the Massachusetts College of Pharmacy, which position he held until a year ago.

Mr. Doliber has been a member of the American Pharmaceutical Association for 53 years.

He was a devoted Swedenborgian. The funeral services were held at the Church of the New Jerusalem, attended by many frends. The trustees of the college, accompanied by

many members of the corporation, attended the funeral in a body. J. W. E.

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HEUSTIS BENJAMIN ALLEN.

Heustis Benjamin Allen, of Richland Center, Wis., for many years a prominent druggist and a member of the State Board of Pharmacy, is dead after an illness of several months. Born in Walworth County, Wis., December 20, 1846, he began mercantile life as a drug clerk when but 13 years old. He learned the drug business in Beloit. In October, 1879, he went to Richland Center, and purchased a half interest in the drug business of F. P. Bowen, and in March, 1883, became sole proprietor. He was the first mayor elected after Richland Center was incorporated as a city, and held many positions of public trust. He was appointed a member of the Wisconsin State Board of Pharmacy by Gov. Davidson in 1906, and was reappointed in April, 1911, by Gov. McGovern; he was elected president of the board in 1910. He was a Mason, and his funeral was according to the Masonic ritual. J. W. E.

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HERSCHELL BOYNTON.

Herschell Boynton died at his home in Biddeford, Maine, on March 26, 1912, after a lingering illness. He was 65 years old. In the death of Mr. Boynton, the state of Maine loses a man of high attainments. Of a naturally retiring disposition, he was unusually well-informed in the technique of his profession and was proprietor of the largest drug store of the county. For many years he was an active member of the Maine Pharmaceutical Association. He became a member of the American Pharmaceutical Association in 1875. J. W. E.

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EDWARD LEWIS BALDWIN.

Edward Lewis Baldwin, of the Ferry Drug Co. of San Francisco, died at San Francisco on May 17, 1912. He has always taken a deep interest in all matters pharmaceutical. He joined the American Pharmaceutical Association in 1909. J. W. E.

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E. W. DITTRICH, M. D.

Wednesday the 19th of June there assembled at 159 E. 81st St., New York, members of the medical, pharmaceutical and other professions to pay a last sad tribute of respect to Dr. E. W. Dittrich, a prominent member and former President of the Yorkville Medical Society, who died at the age of 51 years.

The deceased physician was a former pharmacist and a man of exceptional culture and professional attainments. He was always a welcome guest at pharmaceutical meetings, where his speeches, poured out from a mind richly stored with literary and scientific gems, commanded intense interest from his auditors.

Tall and shapely in figure, his geniality was expressed in his countenance and quickly won the hearts of those who met him. Dr. Dittrich was a characteristic German student, having graduated in arts at Bonn, in 1881, the University which graduated the Kaiser. He was also a graduate of the New York College of Pharmacy, and of the College of Physicians and Surgeons of this city, and Prof. of Dermatology in the N. Y. Post-Graduate School.

He was a member of several societies, amongst which were the Society of Medical Jurisprudence, the New York County Pharmaceutical Society, Deutscher Apotheker Verein, German Society, Odd Fellows, Free Masons, etc.

After the rendering of beautiful vocal and instrumental music, short eulogistic orations were made by the side of the coffin by representatives of the different societies. The pharmacists speaking were Emil Roller and Thomas Latham. The floral tributes filled three carriages to overflowing.

A numerous procession accompanied the remains to Greenwood Cemetery.

THOMAS LATHAM.

NOTE: A paper by Dr. Dittrich appeared in the June number of this journal.

KEEPING DYSPEPSIA OUT OF THE DISPOSITION.

"The business man who lets his dyspepsia get into his disposition, and who makes every one round him suffer because he himself is ill, is syndicating ill-health. We have no right to make others the victims of our moods. If illness makes us cross and irritable, makes us unjust to faithful workers who cannot protest, let us quarantine ourselves so that we do not spread the contagion. Let us force ourselves to speak slowly, to keep anger away from the eyes, to prevent temper showing in the voice. If we feel that we *must* have dyspepsia, let us keep it out of our head, let us keep it from getting north of the neck."—*William George Jordan.*

Proceedings of the Local Branches

"All papers presented to the Association and its branches shall become the property of the Association, with the understanding that they are not to be published in any other publication than those of the Association, except by consent of the Committee on Publication."—Resolution adopted at the Boston Convention, 1911.

Reports of the meetings of the Local Branches should be mailed to the editor on the day following the meeting, if possible. Minutes should be *plainly* written, or typewritten, with wide spaces between the lines. Care should be taken to give proper names correctly, and manuscript should be signed by the reporter.

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CITY OF WASHINGTON BRANCH.

OUT-OF-DOORS MEETING.

On May 25, 1912, at 2:30 p. m., the regular May meeting of the City of Washington Branch was held at the Arlington Experimental Farm of the Department of Agriculture, at Arlington, Va. Dr. Rodney H. True of the United States Department of Agriculture, who has charge of the drug division of the farm, and Dr. Van Vliet, also of the United States Department of Agriculture, were awaiting the members of the Association and their guests (most of whom were late) at the McClellan gate of the Arlington National Cemetery, just opposite the entrance of the farm.

Mr. Flemer, with a party in his automobile, took the wrong road through the military reservation of Fort Myer while en route and had to retrace part of his journey. Mr. Hilton took the old canal road and found the "going" slow and dusty. The Secretary, in his announcements to members, advised them to take the 2:20 train, when he should have informed them that the train left at 2:15, hence a number of members missed that train, but were fortunate to get the next one, but fifteen minutes later.

The first experiment pointed out by Dr. True on the farm was that relative to the raising of wheat, with the aid of a static current of high potential. Two fields of wheat, side by side, were inspected, one in which the influence of the electric current was being tested, and the other where the wheat was being raised without the presence of the current.

None of the members present were good enough farmers to be able to tell what difference, if any, existed between the two crops, but it was explained that the surrounding atmosphere was altered, and some effect was had on the soil by the use of the electric current, and that in several foreign countries, decidedly beneficial results had been obtained.

An inspection of modern harrows and plows followed, and at this point the Superintendent of the Farm. Mr. Butterfield, made his appearance and welcomed the members most cordially.

Attention was invited to the methods of preparing the land for the next year's crop. In one field, rye was beng turned under, while in another rye and vetch were shown, ready to be plowed under. Dr. True explained, at much length, the use of each for fertilizer, and the necessity for the presence of decayed vegetable matter in the soil.

Dr. True then showed that part of the farm devoted to the belladonna plant. Experiments to determine the best fertilizer for this plant are being carried on, on a most extensive scale. Numerous beds of plain soil, and of the soil treated with varying proportions of different fertilizers, have been used in the study of this particular feature.

In all of the experiments with this plant, the plant gets its start in the hothouse and is transplanted after the first steady warm weather makes its appearance.

In previous years, assay has shown very varying quantities of atropine in the belladonna, and plants taken from the same and different rows showed very different strengths. Taken as a whole, the plants averaged the required strength as set forth in the U. S. P., but individual plants would show a much higher percentage than required, while others fall far below the standard.

To produce plants assaying very high in atropine, the seed of plants which yielded high percentum assays last year have been planted, and it is hoped that only plants, assaying high in atropine, will be produced.

Strophanthus is also being experimented with in the same way as belladonna.

Dr. True next showed the rose gardens.

It is the ambition of the Department to produce a rose with a more fragrant odor than the one now so extensively used in Europe for the production of oil, and yet not sacrifice the weight of the petals and oil producing qualities. In this ambition they have apparently succeeded in the hybrid-rose, Rosea Parfuma de l'Hay, which possessed a most pleasing odor, which could be noted many yards away, and an abundance of heavy red petals. Dr. True presented each of the members with a number of the best looking blossoms from these plants.

A further inspection of the rose gardens showed wild roses, blue roses, and nearly all of the well-known cultivated rose plants. A large number of foreign roses were also shown.

Just beyond the rose gardens, the drug gardens containing nearly all of the plants official in the U. S. P., and nearly all of the unofficial plants used and sold in drug stores, are located. More belladonna plants were shown, with couch grass, mandrake, sanguinaria, golden seal, spigelia, colchicum, convalleria, ginseng, cascara, blue cohosh, wintergreen, digitalis, gelsemium, orris, tansy, lavender, caraway, calendula, hedeodoma, wormwood, lappa, boneset, sumach, rosemary, conium, peppermint, hops, valerian, tarragon, bee balm, and a score more.

To attempt to describe all the plants, and the experiments which are being made with each, the process of cultivation, and the many interesting features about them, would take a volume as large as the Pharmacopœia. The best recommendation that can be made, is to visit the gardens.

Much fun was had in trying to guess the various plants without the aid of the indicators at the end of each row. Had there been a "booby" prize, nearly every member would have been entitled to it.

The last part of the visit was taken up in the peony bed, where additional flowers to take home were secured. Here some of the finest specimens of peonies have been produced, and considerable experimental work is being done with plants to be used for decorative purposes in the various parks in Washington.

A number of the members returned directly home, while others took advantage of the opportunity to go through the Arlington National Cemetery, which adjoins the farm and through the military reservation of Fort Myer, which adjoins the cemetery.

The most gratifying feature of the meeting was the unusual interest shown, more than thirty members turning out, and this number was augmented by guests, a number of senior students from Johns Hopkins University of Baltimore, and scientists from the Department of Agriculture.

The Board of Pharmacy of the District of Columbia was well represented, as well as that from Virginia.

The Association thanks Dr. True most heartily for the pleasant outing he furnished, for the fund of information he gave out, and for the good time that every one had.

HENRY B. FLOYD, Secretary.

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ST. LOUIS BRANCH.

The St. Louis Branch of the American Pharmaceutical Association held a special meeting on Friday afternoon, June 7, and through the courtesy of Doctor George T. Moore, director of the Missouri Botanical Garden (Shaw's Garden), and under the guidance of Mr. W. W. Ohlweiler, the following made a general inspection of the garden: William K. Ilhardt, B. J. Herman, Leo H. Suppan, W. P. Overstreet, Solomon Boehm, Martin J. Noll, Louis Lieberstein, Theodore Hagenow, H. O. A. Huegel, George Scheu, E. A. Sennewald, J. W. Mackelden, Arthur C. Schulte, Doctor G. M. Heath, J. B. Seiler, George Hausgen, J. A. Wilkerson, Doctor W. D. Aufterheide and Carl T. Buehler.

This afforded the members a splendid opportunity to see hundreds of medicinal plants in cultivation. J. W. MOCKELDEN.

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NEW YORK BRANCH.

A post-season meeting of the New York Branch was held June 10, on which occasion Dr. Eugen Unna, of Hamburg, Germany, delivered a most interesting address on "Ointment Bases."

Dr. Unna, who is the son of Prof. P. G. Unna, the renowned dermatologist, considered the chief ointment bases, lard, suet, wool-fat, and the petroleum bases from the standpoint of the pharmacist and the therapist, dwelling chiefly upon their physical adaptability to the uses for which they are desired. The shortcomings of each were pointed out, the insta-

bility of the animal fats, and the lack of the property of absorbing liquids which is a fault of the mineral fats.

The speaker discussed the various combination bases designed to overcome the shortcomings of the individual components, reviewing briefly the work of P. G. Unna and others.

To wool-fat in its several forms the speaker paid the greatest attention. It was his opinion that, as this fat is not a stable one and as its value lies in its power to absorb liquids, the crude fat possessing this power to a greater extent, is more useful than the purified forms. The decrease in the power of absorption when wool-fat is purified he attributed to the loss of the oxycholesterin group of alcohols, as these possess the greater portion of the property of absorbing liquids which characterizes wool-fat. In a table, the doctor showed the results of the saponification of wool-fat and the process of separating the oxycholesterin group. He then described the usefulness of this group *per se* as a component of an ointment base, stating that if 5 per cent. of the mixed alcohols of this group, called eucerin wax, were mixed with petrolatum, the mixture would absorb readily up to 500 times its weight of water.

After exhibiting a table showing a comparison of the physical properties of animal and mineral fats and eucerin, the speaker related some of the formulas for ointments now in use in Germany in which eucerin is used. He remarked that the eucerin base was particularly advantageous in mercurial ointment.

At the conclusion of his address, Dr. Unna demonstrated the ease with which water or glycerin may be incorporated with eucerin.

The subject introduced by Dr. Unna was discussed by Messrs. Diekman, Weinstein, Wimmer, Raubenheimer, and Lascoff; and the Branch formally thanked the speaker of the evening.

For the committee on the progress of pharmacy, Otto Raubenheimer reviewed among others the following recently published articles: "A Knowledge of the Glucosides of Digitalis," by Kraft; "The Constituents of Digitalis," by Tambach; "Yohimbine Schmidt," by Kobert; "The Biological Valuation of Sarsaparilla," by Kobert; "The Active Constituents of Ergot," "The Toxicity of Nitro-benzene," "Benzin Accidents in Germany," and "A New Test for Japanese Oil of Peppermint." He also told of new patents granted in Germany on a preparation of digitalis, colloidal sulphur, and other things, and referred to statistics on the cultivation of medicinal plants in Austria and attendance at pharmacal schools in Germany.

Reports were made by Hugh Craig and Otto Raubenheimer as delegates to the meetings of the New Jersey Pharmaceutical Association and the American Medical Association respectively.

As a committee to cooperate with a similar committee of the Medical Society of the County of New York in considering a plan for the certification of pharmacies, President G. C. Diekman appointed the following: C. O. Bigelow, chairman; W. C. Anderson, Peter Diamond, G. C. Diekman, J. L. Lascoff, C. H. Lowe, T. D. McElhenie, Otto Raubenheimer, John Roemer, and John Scavo.

HUGH CRAIG, Secretary.

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NORTHWESTERN BRANCH.

The regular summer meeting was held at Winona, Minn., Wednesday afternoon, June 19. The Branch also held a joint meeting with the Scientific and Practical Section of the Minnesota State Pharmaceutical Association prior to its separate meeting.

The election of officers resulted as follows: President, Stewart Gamble, Hennepin avenue and Ninth street, Minneapolis; Secretary-Treasurer, Prof. Edwin L. Newcomb, College of Pharmacy, University of Minnesota, Minneapolis. The election of Dean F. J. Wulling as Council Representative until 1915 at a previous meeting, was ratified.

The address of the retiring president, Mr. W. A. Frost, of St. Paul, was somewhat brief on account of the pressure of a large program. Mr. Frost expressed the hope that all future meetings might be as successful and profitable as the one that was just then closing, which, according to the consensus of those present, was one of the best scientific sessions held in the Northwest.

Under the chairmanship of Dean Wulling, the following program was carried out, beginning at 1:30 p. m. and closing at 6:20 p. m. It is noteworthy that the attention of all present was closely held to the proceedings for a solid five consecutive hours.

1. "A Report on the Examination of a Series of Drugs Bought in the Open Minne-

sota Market," by Prof. G. Bachman. This paper reported the analysis of something over one hundred drugs and preparations examined recently in the pharmaceutical chemistry laboratory of the University of Minnesota.

2. "Suggested Improvements in a Number of U. S. P. Preparations," by Prof. G. Bachman. The improvements suggested covered Liquor Potassii Arsenitis; Liquor Cresolis Compositus; Elixir Ferri, Quininae et Strychninae Phosphatum; and Glyceritum Amyli.

3. "A Historical Paper on the College of Pharmacy of the University of Minnesota," by Frederick J. Wulling. This paper covered the activities and history of the College during the past year and is the usual annual installment which Dean Wulling is writing on the history of the College.

4. "An Interview with S. W. Melendy on Early Minnesota Pharmacy," by Frederick J. Wulling. Mr. Melendy was to have prepared a paper on the topic of the interview, but on account of illness became temporarily incapacitated to write. Dean Wulling then interviewed Mr. Melendy and reported the interview in the paper which covers the pharmacy of Minneapolis in the early and late seventies.

5. "The College of Pharmacy of the University of Minnesota," by Mr. A. G. Erkel. This most interesting paper pointed out particularly that pharmacists do not sufficiently appreciate the fact that their calling is a trust in their hands and upon which each member, as a trustee, is bound to administer according to the duties which this trust imposes.

Upon vote of the Northwestern Branch and also later upon the vote of the State Association, printed copies of this paper are to be sent to every pharmacist in Minnesota.

6. "Early Minnesota Pharmacy," by A. H. Rose. Mr. Rose reviewed the conditions relating to pharmacy in Minnesota in the fifties and sixties. Mr. Rose, being one of the early pioneer pharmacists of Minnesota, was in a position to write authoritatively as well as interestingly. This paper and the interview with Mr. Melendy are the beginning of a series of papers on Minnesota pharmacy that it is hoped will be written in the near future as a possible basis of a comprehensive work of the history of pharmacy in the Northwest.

7. "The Cultivation of Belladonna in the Medicinal Plant Garden of the College of Pharmacy of the University of Minnesota and Elsewhere," by Manley H. Haynes. This paper embodied part of the research work that Mr. Haynes is prosecuting in the College laboratories toward the master's degree in pharmacy.

8. "The Prerequisite in the State of Washington," by A. F. Maxwell, member of the Washington State Board of Pharmacy. The writer briefly reviewed the conditions pharmaceutic in Washington which lead up to the prerequisite requirement by the Washington board. This paper prompted a vote to test the sentiment of those present on the prerequisite question. Eighty-four per cent. of all present voted for the prerequisite.

9. "A Review of Recent Progress in Pharmacy," by F. A. Upsher Smith.

10. "Cataphoresis or Iontophoresis," by F. A. Upsher Smith. This was a most instructive paper which dealt with the latest developments in ionic medication.

11. "As It Looks Today," by A. D. Thompson. Mr. Thompson was absent and George A. Welch read the paper. It related to the evils of price-cutting in the large cities and advocated higher ethical standards for pharmacy.

12. "Peroxide of Hydrogen Production, Past and Present," by Dr. J. S. Brewer. This very interesting and exhaustive paper covered the subject under the following headings: Historical; process of manufacture; consumption of the medicinal product; properties; method of clarifying; impurities; preservatives; corking the bottles; packing for shipment, etc.

13. "The Cultivation of Medicinal Plants as an Educative Factor in a Pharmacy Curriculum," by Prof. Edwin L. Newcomb. The recent additions in both area and plants to the medicinal plant garden of the College of Pharmacy of the University of Minnesota were reviewed and the value of the garden as an instructional factor emphasized.

14. "The Future of Pharmacy as a Profession," by Richard J. Messing. This was an enthusiastic and forceful advocacy of better training for those entering the ranks and for higher ideals for those already in them. The reading of the paper was repeatedly interrupted by applause.

15. "Medicinal Plants Growing in the

Vicinity of Winona," by Prof. P. C. Myers of the Winona High School. This paper was illustrated with autochrome lantern slides. Something over forty medicinal plants were reviewed and about one-half that number illustrated with the lantern.

The College of Pharmacy exhibited about 250 of its more important medicinal plants. This exhibit aroused the interest of everyone present. The remarks concerning it were all in the superlative.

The next meeting will be held either in Minneapolis or St. Paul sometime during the winter.

F. J. WULLING, Secretary.

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NASHVILLE BRANCH.

On Thursday, June 13, the regular monthly meeting of the Nashville Branch was held in Furman Hall, J. O. Burge presiding.

The election of officers was postponed until the next meeting in September. A resolution was passed recommending the passage by Congress of a bill entitled An Act to Promote the Efficiency of the Medical Department of the United States Army, being House Bill No. 22263 and Senate Bill No. 5725, which seeks to increase the rank and pay of pharmacists in the United States Army.

On motion of R. L. Eves, seconded by Dr. J. R. McDaniel, the President of the Branch was instructed to invite the American Pharmaceutical Association to meet in Nashville in 1913.

A committee was appointed to confer with the Tennessee Pharmaceutical Association at their next annual meeting July 9, at Chattanooga, in regard to its meeting here next year jointly with A. Ph. A., in case the A. Ph. A. decides to meet here.

The reports of Secretary W. R. White and Treasurer C. C. Young were received and approved.

"The Study and Identification of Crude Drugs" was the subject for discussion. A very large and rare collection of crude drugs were exhibited by Prof. E. A. Ruddiman, belonging to the Pharmacy Department of Vanderbilt University, which were extremely interesting and instructive.

The same subject, however, will be continued at the next meeting in September.

WILLIAM R. WHITE, Secretary.

Council Business

COUNCIL LETTER NO. 21.

PHILADELPHIA, June 24, 1912.

Members of the Council:

Motions 40 (*New Record Book*), *No.* 41 (*Journalizing the Report on the Progress of Pharmacy*), *and No.* 43 (*Election of Applicants for Membership from Nos.* 215 *to* 235 *inclusive*) have each received a majority of affirmative votes.

Motion No. 42 (*Tentative Program for* 1912 *Annual Meeting*) has brought forth requests for changes by the chairmen of Sections, and these changes will be made, and the program printed in an early issue of the JOURNAL.

With reference to *Motion No.* 39 (*Temporary Secretary of Scientific Section*), the following has been received from George M. Beringer:

"In my desire to have the work of the Association proceed uninterruptedly, I made a motion a short time ago that Professor F. P. Stroup be named as Secretary Pro Tem. of the Scientific Section, as Secretary Prof. C. H. LaWall found that he would not be able to attend the Denver meeting. In making this motion I overlooked the fact that the Section had already selected an associate who was in line of succession to carry on the work in the absence of any of its officers.

To correct this error I now desire to withdraw the name of Prof. F. P. Stroup as nominee for Secretary Pro. Tem. and substitute the name of F. R. Eldred. This is done with the approval of Prof. Stroup and with a desire to straighten out the inadvertent error and so to avoid any misunderstanding."

Do you approve of substitution of name of F. R. Eldred for F. P. Stroup in *Motion No.* 39? This will be known as *Motion No.* 44 (*Temporary Secretary of Scientific Section*).

The following communication has been sent by the Chairman of the Committee on Publication to the Members of this Committee:

PHILADELPHIA, June 14, 1912.

Committee on Publication:

GENTLEMEN—The Committee on Publication is charged with the duty of issuing for the Association its annual volume or Year Book.

The manuscript copy of the Report on the

Progress of Pharmacy (which constitutes the larger part of the Year Book) for the eighteen months ending December 31, 1911, is now in the hands of the General Secretary and under the best of conditions the book cannot be printed and distributed before the Annual Meeting in August.

At the Boston (1911) Meeting it was estimated that the Report on the Progress of Pharmacy for 1911 would cost $2500. Later, the salary of the Reporter on the Progress of Pharmacy was increased $450, making the probable cost about $3000. Of this amount the expressage and postage was estimated at $400. The probabilities are, however, that it will be over $500, as the expressage and postage for the Proceedings was $503.72 in 1907, $602.12 in 1908, and $684.90 in 1909. The Year Book will be smaller than the Proceedings and the expressage and postage should be, of course, somewhat less.

In Council Letter No. 20, Motion 41 (Journalizing the Report on the Progress of Pharmacy), Edward Kremers moved, seconded by A. H. Clark that "the Council reconsider at the Denver, 1912, Meeting the question of publishing the Report on the Progress of Pharmacy as a separate volume, and to add the money thus saved to the JOURNAL, which could just as well publish the abstracts and do this at a much earlier date. The Reporter on the Progress of Pharmacy could be added to the Editorial Staff of the JOURNAL."

This motion has received a majority of affirmative votes of the Council members, and but five negative votes.

The suggestion has been made that the Year Book for 1911 be printed in the last four issues of the JOURNAL for 1912 as a supplement to the regular issues. By so doing, not only could the expenses of binding and distributing in the ordinary form be saved, but the material would be in the hands of the members almost as quickly as if we went ahead according to the original plan. The matter would probably not amount to more than 400 or 500 pages of 8-point composition or about 100 pages additional in each of the last four issues, instead of 400 pages in a separate volume.

Then in 1913, the Report on the Progress of Pharmacy could be issued as a supplement to the JOURNAL in March, June, September and December, with the official data, etc., in the December number.

With reference to the Year Book, Editor Beal writes: "It would save a thousand dollars a year at the very least, and possibly two thousand, to publish the Report in the JOURNAL, and I feel that eventually this will be done. The argument in favor of the Report as a separate volume is mainly due to sentiment, and the question for us to decide is whether this sentiment is worth what it costs? While the cessation of the annual volume would be a detriment in some respects to the membership, the greatly enhanced value of the JOURNAL, if the additional money were spent upon it, should I think more than offset it."

Dr. H. M. Whelpley writes: "I am inclined to feel that it is best to do away with the Year Book and publish everything in the JOURNAL. It looks to me now as if this would be a matter of great convenience as well as a saving of money. If you think best we might put the matter squarely before the Council. If we publish only one issue of the Year Book, it will indeed be an orphan, or rather without brothers and sisters."

Your Chairman presents this question to you, and asks your immediate consideration of the matter, so that if it is decided to place the matter before the Council it can be done at once.

This Committee has not the power of itself to decide the question. It was directed by the Association to publish the book in the early part of 1912. This, however, has been impossible because of the delay in receiving the manuscript.

Hence, the Committee must go ahead and issue the book unless the Council decide otherwise. The only thing to do, apparently, if a majority of the members of the Committee on Publication wish to journalize the Year Book, is to offer a motion in Council—the Executive body of the Association—stating that since numerous members of the Council have favored the motion of Dr. Kremers, and since it will be impossible to print the book before the Denver (1912) meeting in August, that the General Secretary be requested to withhold the matter from the printer until the subject can be more thoroughly considered at Denver.

Do you vote in favor of having such a motion submitted to the Council?

Very truly yours,

J. W. ENGLAND,

Chairman of Committee on Publication.

In response to this, the Committee, by a vote of seven in the affirmative to one in the negative, agreed to the motion.

Do you, as a member of the Council, favor the motion that the General Secretary of the Association be requested to withhold the matter for the Year Book (Report on the Progress of Pharmacy) for 1911 from the printer until the subject can be more thoroughly considered at the Denver (1912) meeting?

This motion will be regarded as *Motion No. 45 (Postponement of Publication of Year Book (Report on the Progress of Pharmacy) for 1911 until after the Denver (1912) meeting)*.

J. W. ENGLAND,
Secretary of the Council.

415 N. 33d St., Philadelphia, Pa.

Changes of Address

All changes of address of members should be sent to the General Secretary promptly.

The Association will not be responsible for non-delivery of the Annual Volume or Year Book, or of the JOURNAL unless notice of change of address is received before shipment or mailing.

Both the old and the new address should be given, thus:

HENRY MILTON,
From 2342 Albion Place, St. Louis, Mo.
To 278 Dartmouth St., Boston, Mass.

Titles or degrees to be used in publications or in the official records should be given, and names should be *plainly* written, or typewritten.

<>

AUGUSTUS TRACEY,
From 471 G St. S. W., Washington, D. C.
To 479½ F St. S. W., Washington, D. C.

R. C. REILLY,
From 3300 Merramec, St. Louis, Mo.
To Box 1609, Los Angeles, Cal.

W. J. NOLL,
From 925 Goodfellow, St. Louis, Mo.
To 5591 Vernon, St. Louis, Mo.

MORRIS KANTOR,
From 1388 Clinton Ave., New York, N. Y.
To 522 West 152d St., New York, N. Y.

C. C. CANNON,
From Vineyard Haven, Mass.
To P. H. & M. H. S., Chicago, Ill.

GEORGE WILLIAM COLLINS,
From 2601 Olive St., St. Louis, Mo.
To 3400 Morgan St., St. Louis, Mo.

WILLIAM H. SMIJH,
From Park Ave., White Plains, N. Y.
To Bronx Manor, Yonkers, N. Y.

WILLIAM A. HERRICK,
From 901 E. 75th St., Chicago, Ill.
To 213 E. Mills St., Beaver Dam, Wis.

H. M. BILLINGS,
From 28 W. 50th St., New York, N. Y.
To Care Forrest Walker, South Poland, Maine.

FRED I. LACKENBACH,
From 970 Post St., San Francisco, Cal.
To Butler Bldg., San Francisco, Cal.

SIDNEY C. YEOMANS,
From Long Beach, Calif.
To 140 Nassau St., New York, N. Y.

JEROME J. KEENE,
From 354 W. Washington St., Indianopolis, Ind.
To 124 E. 22d St., Indianapolis, Ind.

LEVI WILCOX,
From 22 Mitchell Ave., Waterbury, Conn.
To 145 Woodlawn St., Waterbury, Conn.

THEODORE J. BRADLEY,
From 43 Eagle St., Albany, N. Y.
To Care Mass. College of Pharmacy, Boston, Mass.

M. N. FORD,
From Delphos, O.
To Secretary State Board of Pharmacy, Columbus, O.

LEON M. GUERRERO,
From 34 Nueva Ermita, Manila, P. I.
To 117 Nueva Ermita, Manila, P. I.

DANIEL M. RAND,
From 12 Westcott St., Portland, Maine.
To 876 Main St., Westbrook, Maine.

FRANK H. KIRK,
From 1400 Spruce St., Philadelphia, Pa.
To Curwensville, Pa.

HERMAN J. WEBER, Sgt.
From Honolulu, H. I.
To Fort Matt, Salem, N. J.

LIVING UP TO ADVERTISEMENTS.

Many druggists lose more than the value of their advertisements by not living, or dealing, up to them. A customer attracted to a store by an advertisement of an article and disappointed by finding that the value of the article was grossly exaggerated or who meets with poor service is not merely disappointed in a bargain, he is disappointed in the store and its methods of doing business, and he takes care not to go there again. Successful business men have learned that the poorest kind of advertising is that kind intended to fool people or which fools them by leading them to expect goods or service that the advertiser does not give them. Everything done in a drug store is an advertisement of its quality and way of doing business. The clerk who jokes and laughs with a friend while wrapping up a prescription for a waiting customer is an advertisement, and a poor one, of the store or himself; the proprietor who has to hunt around and rummage through drawers for something asked for by a customer is an advertisement of poor methods and lack of system. There are too many drug stores in the average town or city nowadays for the owner or clerk in any one to neglect anything that will attract trade and hold it, and when everybody is advertising themselves in some way it is safest and best to advertise oneself by doing things as well as promising them.—*American Druggist.*

THE STORE PAPER.

According to the testimony of a good many druggists, there is no kind of advertising so rich in returns for the druggist as a store paper published each month. If no druggist in your territory is issuing such a paper, they earnestly advise their brother druggists to launch one at once.

Call it Smith's Monthly, or Smith's Bulletin, or Smith's whatever-you-please. Have it printed just as a regular journal or paper would be, with a title, publisher's name, and all that sort of thing. If you can make the journal interesting enough so that people will look forward to its arrival every month, you have gained your point, for you may be sure that if they read the text matter, they can scarcely avoid reading some of the display ads.

Possibly you are thinking this rather an expensive means of advertising, and you are not wholly wrong. It is rather expensive, but it richly pays for itself in returns. The results will far more than pay you for it if you have a journal that is interesting and attractive and gotten out as it should be. It will make your name and business familiar in every home in the neighborhood.

Indeed, it will be like a personal visit from you every month. Instead of sinking into obscurity and being lost in a hurrying city, you will be known all over your section, and when people want anything in the drug line they will at once think of you. A store paper will bring you more new customers and keep more of them for you, than any advertising plan known.—*N. A. R. D. Notes.*

LIQUIDS BY WEIGHT.

All liquids by weight is the ideal manner of handling pharmaceuticals, but the old plan of solids by weight and liquids by measure has such a firm hold on the pharmaceutical world that it is difficult to make the change and have the rule of both solids and liquids by weight followed in commercial transactions. The government has decided that wholesale dealers must henceforth sell liquids by weight instead of by measure. The contents of the container must be shown by stamping on the bung stave of the barrel or cask, or upon the outside of the can, the gross weight, the tare and the net weight of the contents of the package. The time may come when all business transactions and pharmaceutical manipulations will weigh liquids as well as solids.—*Meyer Brothers' Druggist.*

DR. OSSLER'S INVITATION TO THE ANTI-VACCINATIONISTS.

"I will go into the next severe epidemic with ten selected vaccinated persons and ten selected unvaccinated persons. I should prefer to choose the latter—three members of Parliament, three anti-vaccination doctors if they could be found, and four anti-vaccination propagandists. And I will make this promise—neither to jeer nor to jibe when they catch the disease, but to look after them as brothers, and for the four or five who are certain to die I will try to arrange the funerals with all the pomp and ceremony of an anti-vaccination demonstration."—*New England Medical Journal.*

WHY NOT IN THE U. S. ALSO?

The London Board of Trade has received a report from the British Consul at Christiania, Sweden, pointing out that private persons in Norway are not permitted to receive patent or proprietary medicines from abroad by post. On the arrival of such parcels, which are opened at the customs house before delivery, the contents are stopped by the authorities. In order to comply with the law, it appears necessary for private persons desiring to import medicines for their personal use to have the parcel addressed to a resident chemist, who thus becomes responsible for the importation.—*National Druggist.*

OLD REGRETS AND NEW WISDOM.

"The man who looks back upon his past life and says, 'I have nothing to regret,' has lived in vain. The life without regret is the life without gain. Regret is but the light of fuller wisdom, from our past, illumining our future. It means that we are wiser today than we were yesterday. This new wisdom means responsibility, new privileges; it is a new chance for a better life. But if regret remain merely 'regret,' it is useless; it must become the revelation of new possibilities, and the inspiration and source of strength to realize them. Even omnipotence could not change the past, but each man, to a degree far beyond his knowing, holds his future in his own hands."—*William George Jordan.*